Ephemera relating to

Audio Home Study Guide

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A STUDY GUIDE FOR

FUNDAMENTALS OF RARE COIN COLLECTING AND INVESTING

HOME STUDY COURSE

Institute of Numismatic and Philatelic Studies
Adelphi University
Garden City, New York 11530

ACKNOWLEDGMENT

To the following devoted Panel of Lecturers who have taken the time and effort to prepare these lessons, the Institute of Numismatic and Philatelic Studies owes a debt of gratitude:

Stanley Apfelbaum
Walter Breen
Grover C. Criswell
John J. Ford, Jr.
Harry J. Forman
David Ganz
William Gay
Donald J. Hoppe
Charles R. Hoskins
A. George Mallis
Herbert Melnick
Walter Perschke
Edward C. Rochette
Anthony Swiatek
Leroy Van Allen
Luis Vigdor

The Institute wishes to thank Ms. Thelma Cline, Supervisor, Distribution Services, Instructional Media Center at Adelphi University, and her staff for their assistance and cooperation in taping the course-in-residence; and Donna Albert and William F. Smith, Jr. of First Coinvestors, Inc., Albertson, New York for the graphic design.

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GENERAL INFORMATION

INSTRUCTIONS AND SUGGESTIONS FOR HOME STUDY:

As you begin your work in this course, you should be aware of the unique qualities of home study. Perhaps its most unusual aspect is the freedom to determine your study patterns. You can establish your own study schedule and satisfy your own standards of thoroughness of preparation, without the pressure of classroom deadlines. Although the amount of time you take to complete this course can be adjusted to your individual circumstances, you will probably discover that working with reasonable speed and steadiness to finish the course in five to seven months at the most is the best plan.

SUPPLIES:

Textbooks - A current edition of A Guide Book of U.S. Coins by R.S. Yeoman is included for your information. The text should be used for historical background and not for prices as these change daily due to the volatile silver and gold market. Prices are shown as a guide only and are not intended to serve as a price list.

Envelopes bearing the printed address of the Institute of Numismatic and Philatelic Studies are included with the study guide. The special envelopes are to be used for the final examination and any inquiry that you may have.

PREPARATION OF HOME STUDY COURSE:

The cassettes can be activated on any standard cassette tape recorder. Be sure to proceed through the lessons in the order in which they are presented.

Adelphi University does not lend cassette tape recorders or play-back units. If you do not have one, you may purchase one through the Institute. The Panasonic portable cassette recorder is available at a special price, as outlined in the home study brochure.

FINAL:

The final examination consists of 40 multiple-choice questions and is to be completed without the aid of dictionaries, textbooks, cassettes, study notes, your study guide, or any other supplementary materials.

Complete the final examination and mail it in one of the envelopes provided.

GRADING PROCEDURE:

Examinations - You are responsible for completing a final examination. If you have any questions, write to the Institute of Numismatic and Philatelic Studies. You must pass the final examination to pass the course and receive your Certificate of Achievement.

Certificate of Achievement - After your final examination is graded, a Certificate of Achievement will be mailed to you. The certificate is from Adelphi University's Institute of Numismatic and Philatelic Studies and attested to by its Dean and the Director of the Institute.

TIME ALLOWANCE FOR INDEPENDENT STUDY:

The optimum time for completion of the average college course is five to seven months. If you wish to reduce this time, you may.

Maximum Allowance and Extensions - Each student is allowed one calendar year from the date of registration in which to complete the course. When the work cannot be completed in this length of time, an extension of six months will be granted. You may have two such six-month extensions.

FOR FURTHER INFORMATION ABOUT HOME STUDY:

Questions regarding the administration of your courses or requests for information about other courses should be addressed to Ms. Gloria Greene, Director of the Institute of Numismatic and Philatelic Studies, Adelphi University, Garden City, New York 11530. The Institute publishes a brochure each semester describing its course offerings. A copy will be sent on request. There is a Brochure Request form at the back of your study guide.

LESSON 1: INTRODUCTION TO NUMISMATICS
by Stanley Apfelbaum

In 1978, Stanley Apfelbaum founded and is currently the Executive Director of the Institute of Numismatic and Philatelic Studies at Adelphi University, presently offering beginner and advanced courses in numismatic and philatelic studies.

He is President and Chairman of the Board of First Coinvestors, Inc., one of the country's largest publicly-owned rare coin and stamp companies.

In 1975, he was requested by the American Numismatic Association to head a Task Force that would be responsible for coordinating the efforts of various experts in the field of grading and formulating of acceptable standards throughout the hobby. This resulted in the A.N.A.'s Grading Board.

Mr. Apfelbaum writes an investment column on rare U.S. coins that has appeared in newspapers throughout the U.S.

He is a life member of the American Numismatic Association, the Great Eastern Numismatic Association, and the Numismatic Literary Guild, and is also a member of the American Bar Association, the New York State Trial Lawyers Association, and the Brooklyn Bar Association.

LESSON 2: HOW YOU CAN KEEP ON MAKING BIG PROFITS INVESTING IN COINS

by Harry J. Forman

Harry J. Forman has been a Philadelphia coin dealer since 1956. Prior to that, he was a fruit peddler on a street corner in Philadelphia.

Today, he is known as one of the most renowned professional numismatists in the field, one who has been able to make predictions that have almost always proven accurate. His books, "How You Can Make Big Profits Investing in Coins" and "How You Can Keep on Making Big Profits Investing in Coins," have been the guide for many numismatic investors.

Well respected in the numismatic community, he has been called the "dealer's dealer" by his contemporaries. Mr. Forman has lectured all over the U.S., most recently at the Numismatic Literary Guild where Coin World taped his entire speech and published it verbatum.

He is a life member of the American Numismatic Association, a member of the Professional Numismatists Guild, and dozens of other numismatic associations.

NOTE: The prices quoted by Mr. Forman have fluctuated since his lecture at the Institute.

LESSON 3: TYPE COLLECTING
by David L. Ganz

A full-time practicing attorney, David L. Ganz has represented most of the major coin dealers. He serves as legislative counsel to the American Numismatic Association, has been a collector for more than two decades, and has won a reputation as one of the leading numismatic writers, with more than 3,000 published articles over the past dozen years.

A former consultant to the House of Representatives Banking Subcommittee dealing with coinage, he serves as a special correspondent to Coin World, and a contributing editor to COINage Magazine.

Mr. Ganz is the author of the only law review article on the revision of minting and coinage laws of the U.S. and the newly-released book, "World of Coins and Coin Collecting."

LESSON 4: COLONIAL AND PAPER MONEY
by Grover C. Criswell

Grover C. Criswell is recognized as one of the nation's leading dealers in paper money, especially Confederate currency - and has written a number of books and articles on this subject. Always in demand as a speaker, he has lectured extensively for more than 25 years throughout the United States, Canada and Mexico.

In 1957, he wrote "Confederate & Southern States Currency" which has become a standard text in the field. He is also the author of "Confederate & Southern States Bonds" and "North American Currency" and has written a large number of articles for hobby periodicals.

Grover C. Criswell has been in the mail-order business for 33 years, starting his business at the age of 12. He served as President of the American Numismatic Association from 1977-1979. As president, Criswell became well known to many senators and representatives and testified extensively before various congressional committees concerning commemorative coinage and the gold medallion act of 1978. He served for 12 years as a member of the Board of Governors of the A.N.A., a member of the Board of Overseers of the Institute of Numismatic and Philatelic Studies, one of the founders of Florida United Numismatists (FUN) and a member of its Board of Directors.

LESSON 5: U.S. MORGAN & PEACE SILVER DOLLARS
by A. George Mallis

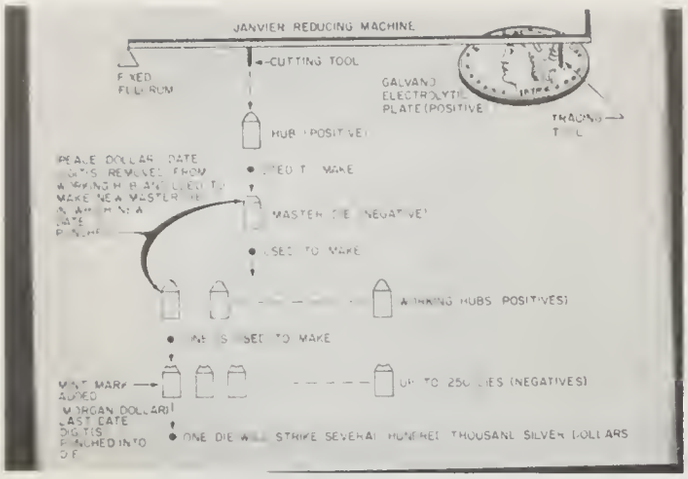
A. George Mallis was born in Springfield, Massachusetts and educated in its public school system. He attended Worcester Polytechnic Institute and Lafayette College, obtaining from the latter a Bachelor of Science Degree in Civil Engineering (with honors) in 1939, and a Civil Engineering Degree in 1942.

A registered professional engineer in 14 states, and the holder of a National Council of Engineering Examiners Certificate of Qualification, he served as a member of the Massachusetts State Board of Registration of Professional Engineers and Land Surveyors from 1969 to 1977 and is currently a member emeritus.

He is the author of "List of Die Varieties of Morgan Head Dollars" (1946); co-author with Leroy C. Van Allen of "Guide to Morgan and Peace Dollars" (1971); and a revision of their work, entitled "Comprehensive Catalogue and Encyclopedia of U.S. Morgan and Peace Silver Dollars;" was awarded the Numismatic Literary Guild's prestigious "Book of the Year" award in 1977.

In 1962, he served on the United States Assay Commission. He is a member of the Springfield, Massachusetts Coin Club, the American Numismatic Association, the American Numismatic Society, the British Numismatic Society, the New England Numismatic Association, and the Numismatic Literary Guild. In 1974, he was awarded the Numismatic Literary Guild "Writer of the Year" award for the best writer in The Numismatist; and in 1976, he was awarded the Bronze Heath Literary Award from the American Numismatic Association. He is listed in Who's Who in Engineering and in Who's Who in the East.

NOTE: Photographic copies of the slides used in the course-in-residence have been made available by Mr. Mallis on pages 6-15.



1. Making a die

2. 1878 - 8TF - Obv. I

3. 1878 - 8TF - Rev. A

4. Rev. A - 8TF - Parallel arrow feathers

5. Rev. A^1 - Raised beak

6. Rev. A^2 - Hooked beak

7. 1878 - Obv. II

8. 1878- Rev. B - 7TF - parallel arrow feathers

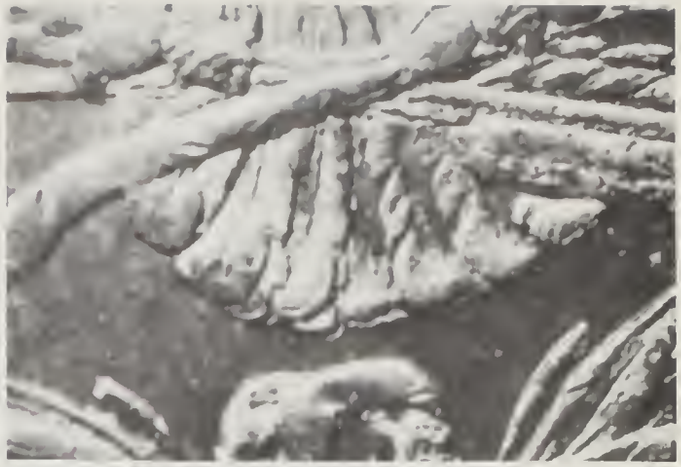
9. 1878 - 7TF, Rev. B^1, long arrow feathers

10. 1878 - 7TF, Rev. B^2- short arrow feathers

11. 1878 - 7/8TF, Obv. II/I

12. Obv. II/I double "Liberty"

13. Rev. B/A, 7/8TF - 1878 (5TF showing)



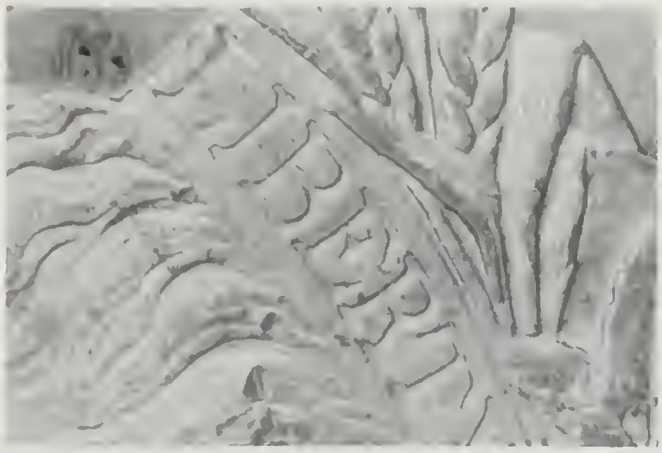
14. 1878-P, 7/8TF (4TF showing)

15. Rev. B/A, 7/8TF(3TF showing)

16. Obv. III[1]

17. Obv. III[1], "er" of Liberty touches

18. Obv. III[2], "er" does not touch

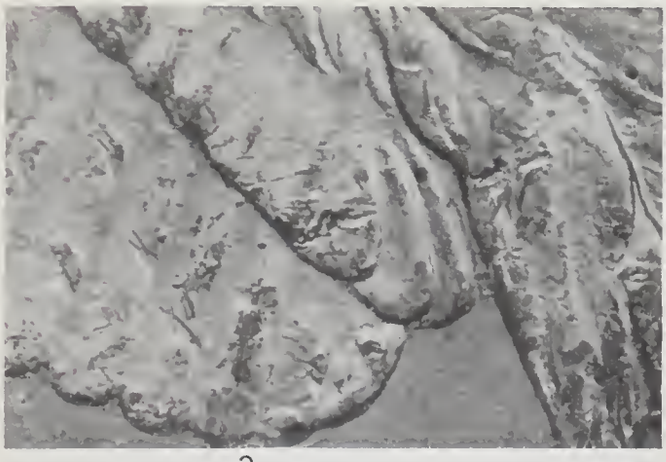


19. Obv. III^2, "er" does not touch

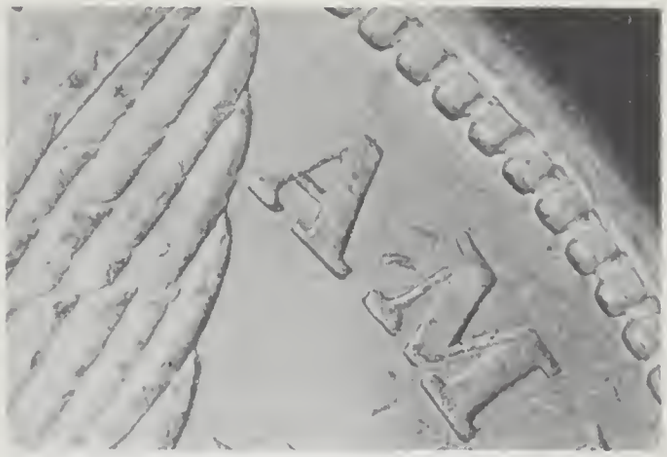
20. Rev. C, slanted arrow feathers

21. Rev. C^1, "A" nearly touches wing

22. Rev. C^1, feather not connected to body



23. Rev. C^2, wing and line to body



24. Rev. C^3, "A" away from wing

25. Rev. C^3, wing connected to body

26. Rev. C^4

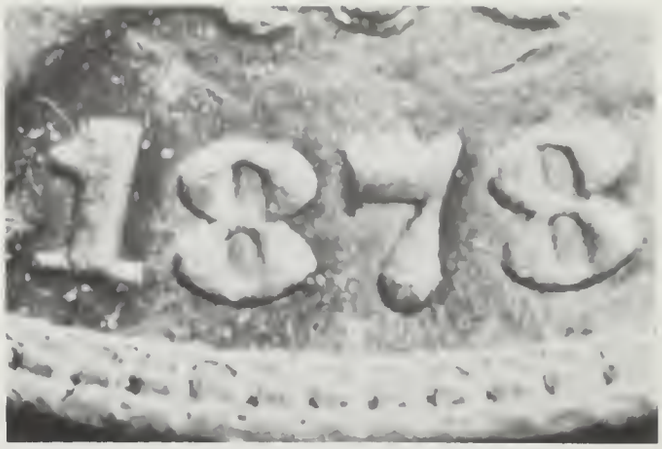
27. 1921 Obv. IV

28. 1921 Rev. D

29. "S" mint types

30. "CC" mint types

31. "O" mint types



32. 1878, Obv. II/Obv. I - date doubled

33. 1880-P, 8/7 (spikes)

34. 1880-P, 8/7 (crossbar)

35. 1880-CC, 80/79

36. 1884-P, "dot" on obv.

37. 1887-P, 7/6

38. 1887-O, 7/6

39. 1887-O, doubled 1,tripled 7

40. 1888-O, doubled 18-8

41. 1888-O, doubled head

42. 1888-O, doubled head

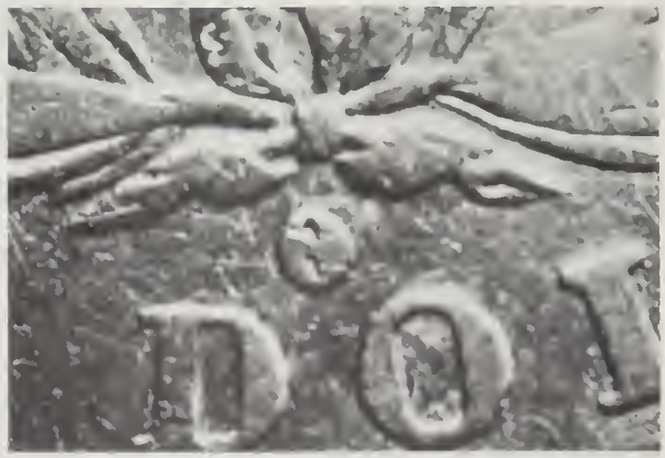
43. 1892-CC, filled 2

44. 1897-S, doubled 1-7

45. 1899-P, doubled 9

46. 1879-CC, large "CC" over small "CC"

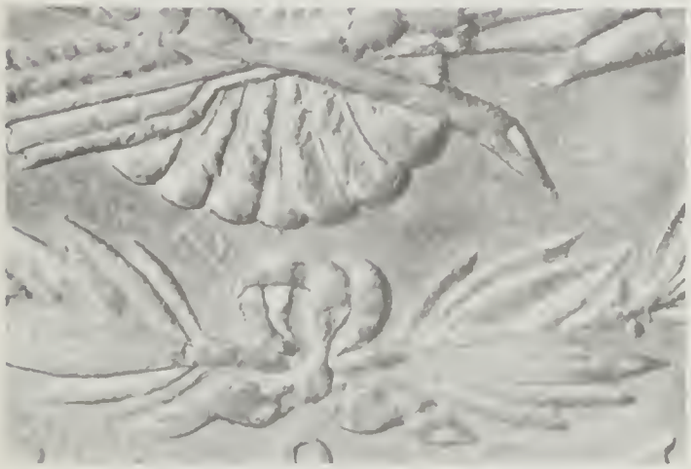
47. 1882-O, O/S depressed



48. 1882-O, O/S flush

49. 1883-0, 0/0 low

50. 1884-0, 0/0 right

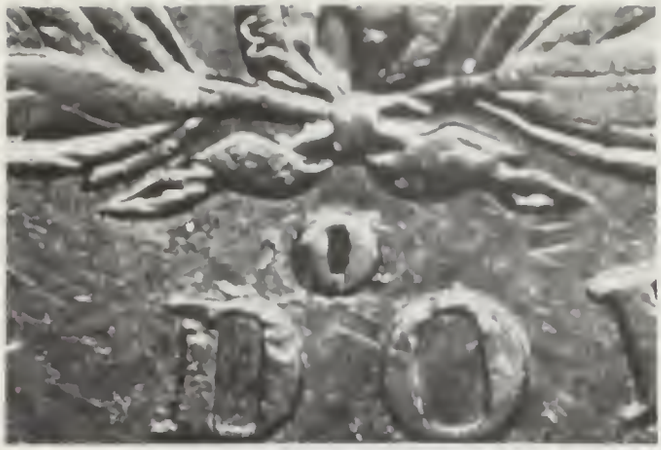


51. 1886-0, E on reverse

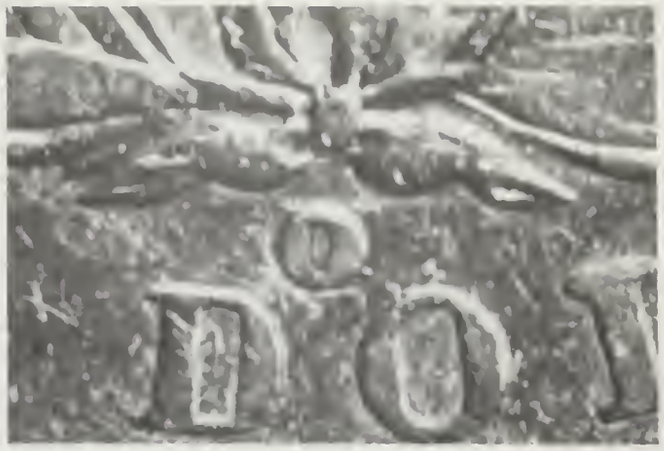
52. 1889-0, E on reverse

53. 1900-0, 0/CC low

54. 1900-0, 0/CC centered and shifted left



55. 1900-0, O/CC centered with extra metal



56. 1900-0, O/CC shifted right and high

57. 1901-P, shifted eagle

58. 1921-P, infrequently reeded

LESSON 6: GOLD AND ITS RELATION TO NUMISMATICS
by Luis Vigdor

Luis Vigdor was raised in Bolivia and came to the United States in 1956. He is presently Vice-President of Manfra, Tordella & Brookes, Inc., the well-known bullion and numismatics firm in New York City.

Mr. Vigdor began his career with Manfra, Tordella & Brookes, Inc. as a messenger in 1958. Since then, he has worked in many facets of the company including administration, foreign exchange, bookkeeping and is currently in charge of the Numismatic and Bullion operation located in Rockefeller Center. Mr. Vigdor speaks several languages fluently which has helped him in the development of overseas business in several European and Latin American countries.

During his career, Mr. Vigdor has acted as advisor to the Central Bank of Panama in the disposal of a large silver coin accumulation. In addition, he performed similar functions with the Central Banks of Peru, Chile and Uruguay.

During a business trip to the Soviet Union, he was requested by the Foreign Trade Bank of the U.S.S.R. to write a study of previous Olympic coins and to make recommendations for future issues. This study was very well received and many of the recommendations were implemented in the Moscow Olympic coin program.

Mr. Vigdor is a Life Member of the American Numismatic Association and a member of the Professional Numismatists Guild.

LESSON 7: TYPE COINS, BU ROLLS, PROOF SETS
by Walter Perschke

Walter Perschke is president of Numisco, Inc., one of the oldest and largest coin brokerages in the U.S. He is also publisher/editor of the Numisco Letter and Independent Speculator, comprehensive newsletters on coins, precious metals, and currencies.

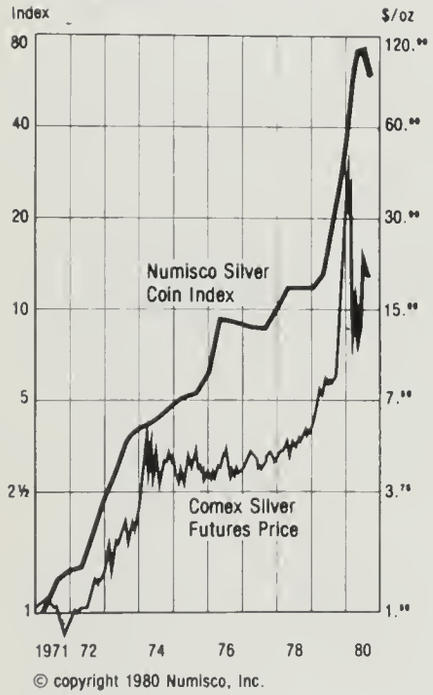
A frequent speaker at investment seminars and forums, Mr. Perschke has been quoted by leading publications, including the Wall Street Journal, Time, Newsweek, the Journal of Commerce, and most recently Money Magazine. He is a contributor to the Guide Book to U.S. Coins and the Handbook of U.S. Coins, commonly referred to as the Redbook and Bluebook.

In 1970, Mr. Perschke organized the National Numismatic Network, Ltd., a unique teletype communication system for use as a buying and selling medium by coin and precious metals dealers. The "Network", of which he is president, is an invaluable information source as well as an active marketplace.

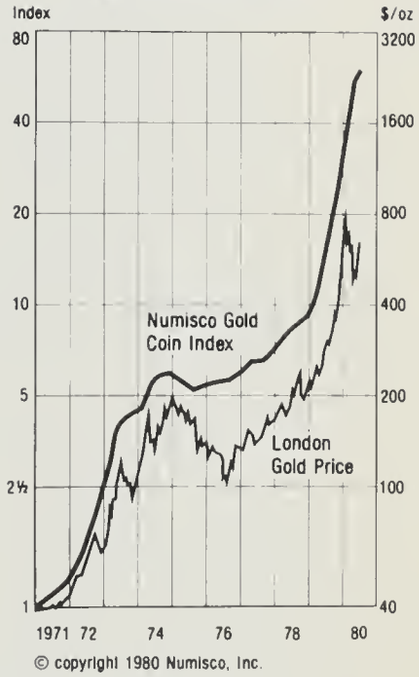
Mr. Perschke is also president of the only closed-end numismatic investment fund. In addition, he is a commodity fund portfolio manager, a consultant to a Swiss bank and since 1969, has been a member of the Mid-America Commodity Exchange.

NOTE: The prices quoted by Mr. Perschke have fluctuated since his lecture at the Institute. The index used by Mr. Perschke has been reprinted with his permission on pages 18 and 19.

SILVER NUMISMATICS
versus SILVER BULLION



GOLD NUMISMATICS
versus GOLD BULLION



TWELVE COIN GOLD TYPE SET
BU-65 WHOLESALE BUY PRICES

	1-1-71	7-31-79	4-25-80	INDEX
$1 Type I	$ 54.00	$1,800	$ 6,000	111.11x
$1 Type II	450.00	6,750	21,000	46.67x
$1 Type III	60.00	1,650	5,000	83.33x
$2 1/2 Liberty	46.00	750	2,150	46.74x
$2 1/2 Indian	32.00	775	2,250	70.31x
$3	275.00	3,150	15,000	54.55x
$5 Liberty	28.00	725	2,150	76.79x
$5 Indian	46.00	1,450	3,700	80.43x
$10 Liberty	34.00	850	2,400	70.59x
$10 Indian	53.50	1,250	3,600	67.29x
$20 Liberty	58.50	550	1,250	21.37x
$20 St. Gaudens	58.50	485	1,000	17.09x
TOTAL:	$1,195.50	$20,185	$65,500	54.79x

NUMISCO SILVER COIN INDEX
BU-65 WHOLESALE BID PRICES

	3/71	9/79	6/80	INDEX
Three cent silver, Type III	$ 36.00	$ 725.	$2700.	75.00
Seated Half Dime w/stars	25.00	800.	3650.	146.00
Seated Half Dime w/legend	22.50	650.	2500.	111.00
Seated Dime w/stars	26.50	1500.	4400.	166.04
Seated Dime w/legend	21.00	550.	2200.	104.76
Twenty Cent Piece	130.00	2250.	8000.	61.54
Seated Quarter w/motto	42.00	1050.	4800.	114.29
Barber Quarter	36.00	675.	2500.	69.44
Seated Half Dollar w/motto	52.50	1350.	5500.	104.76
Seated Half w/arrows (1873-74)	159.00	2500.	7200.	45.28
Barber Half Dollar	87.50	1600.	5000.	57.14
Seated Dollar no motto	85.00	2000.	4000.	58.82
TOTAL:	$723.00	$15,650.	$52,450.	72.55

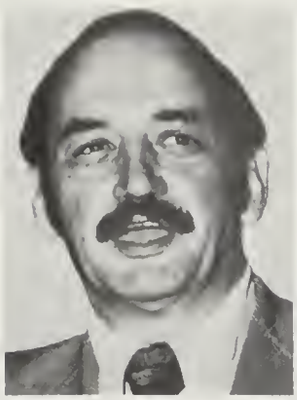
LESSON 8: U.S. COMMEMORATIVE COINS
by Anthony Swiatek

Anthony Swiatek is recognized as the leading expert in the area of silver and gold commemorative coinage. He is co-author with Walter Breen of the Encyclopedia of U.S. Gold and Silver Commemorative Coins 1892-1954, published by FCI/Arco Publishing Co., Inc., the first comprehensive work on commemorative coinage ever attempted. He has a column appearing regularly in Coin World; has written for COINage Magazine, the F.C.I. Rare Coin and Stamp Advisory, the Numismatic Scrapbook and the Forecaster.

Mr. Swiatek is also a regular contributor to Scott's Standard U.S. Coin Catalog where he has his personal section dealing with altered and counterfeit coins; to the Buy and Sell Price Guide to U.S. Coins; and to the new Official A.N.A. Grading Standards for U.S. Coins where he developed today's grading standards for the commemorative coinage of the United States of America. He is also First Coinvestors' Commemorative Consultant as well as the American Numismatic Association Certification Service Consultant in this area.

Mr. Swiatek is a life member of the American Numismatic Association and a member of the American Numismatic Society.

LESSON 9: MEDALLIC COLLECTING
by Edward C. Rochette



Edward C. Rochette is Executive Vice-President of the American Numismatic Association, headquartered in Colorado Springs, Colorado.

Born and raised in Worcester, Massachusetts, he studied art at Clark University in Worcester and at Washington University in St. Louis, Missouri. He graduated from the School of Meteorology at the Spartan School of Aeronautics in Tulsa, Oklahoma.

He joined Krause Publications in 1960 to be executive editor of Numismatic News and Coin Magazine, was the founding editor of both Canada Coin News and The Coin Dealer and is the author of the syndicated newspaper column, "Coin Roundup." He wrote a number of numismatic works, including "Medallic Portraits of John F. Kennedy," for which he received the Sandra Rae Mishler Cataloguing Award. He moved on to the Colorado Springs organization in 1967 to edit its official journal, The Numismatist, where he earned the Numismatic Literary Guild's Best Feature Writer Award for two consecutive years, 1971 and 1972.

Mr. Rochette's national fame was confirmed when President Lyndon Johnson named him to the Assay Committee, charged with the responsibility to see that the coinage of the United States is struck in accordance with the specifications set by Congress.

A frequent lecturer at the Institute of Numismatic and Philatelic Studies, Mr. Rochette currently serves on its Board of Overseers.

LESSON 10: THE MINTING PROCESS
by Leroy Van Allen

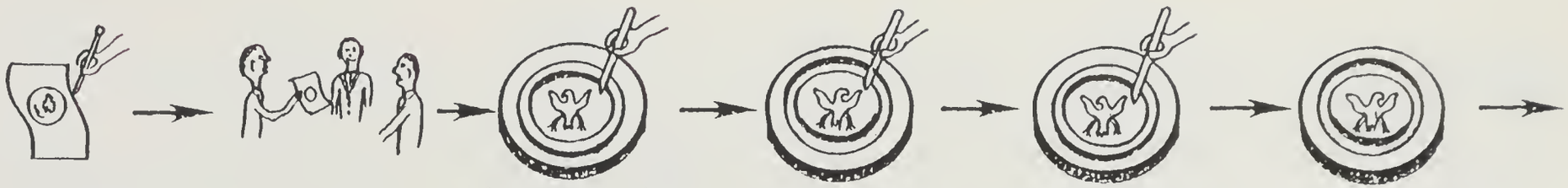
Leroy Van Allen holds a Bachelor and Masters Degree in Electrical Engineering. He is currently working for Wheeler Industries in Washington, D.C. doing studies and reports of systems for the U.S. Navy.

He has written numerous books and articles on coins. In 1971, George Mallis and he joined together and wrote "Guide to Morgan & Peace Dollars." It was revised in 1976 as the "Comprehensive Catalogue & Encyclopedia of U.S. Morgan & Peace Silver Dollars." This book has become the standard reference on Morgan & Peace Silver Dollars and was awarded the Numismatic Literary Guild's Book of the Year Award for 1977.

Mr. Van Allen is a member and past president of the Maryland Numismatic Association, President of the Numismatic Error Collectors of America, and a member of the Numismatic Literary Guild and the American Numismatic Association.

NOTE: The handouts used in class by Mr. Van Allen have been reprinted with his permission on pages 23-62.

STEPS IN PREPARING MASTER HUB



Prepare Sketches and Drawings

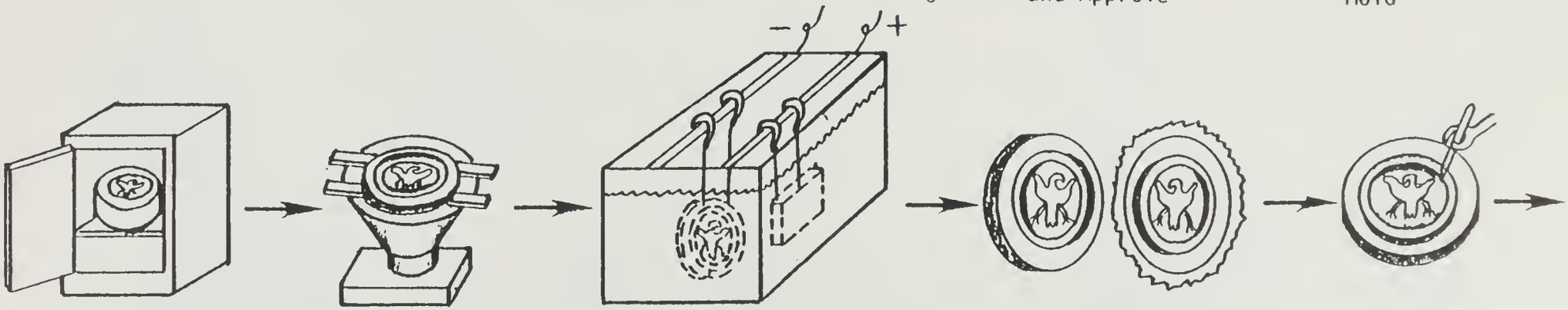
Review and Approve Drawings

Prepare Design in Wax 6-8 Times Coin or Medal Size

Transfer Design to Negative Plaster Mold- Add Lettering

Transfer Design/ Lettering to Positive Plaster Mold- Touch-up and Approve

Transfer Design/ Lettering to Negative Plaster Mold



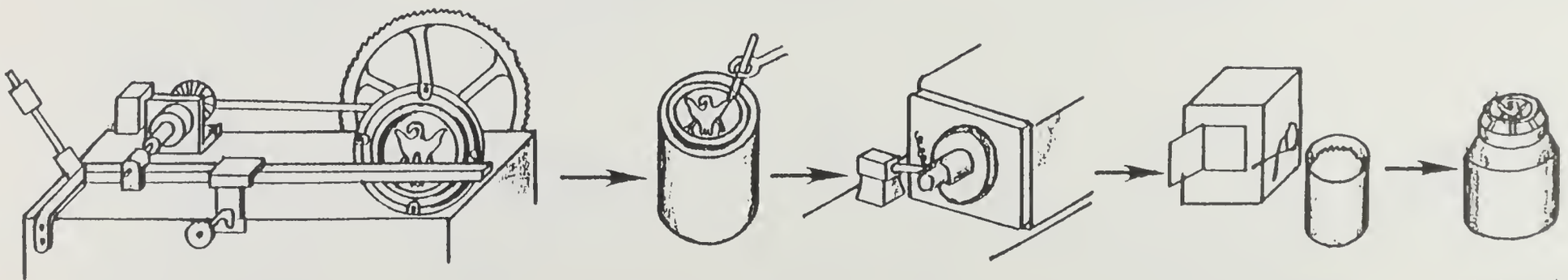
Saturate Negative Plaster Mold with Hot Beeswax in Oven

Cover Mold with Copper Dust

Electroplate Copper onto Mold

Separate Copper Shell from Mold and Trim

Touch up Copper Shell and Back with Plaster to form Galvano



Transfer Galvano Design into Hub Face using Janvier Reducing Lathé

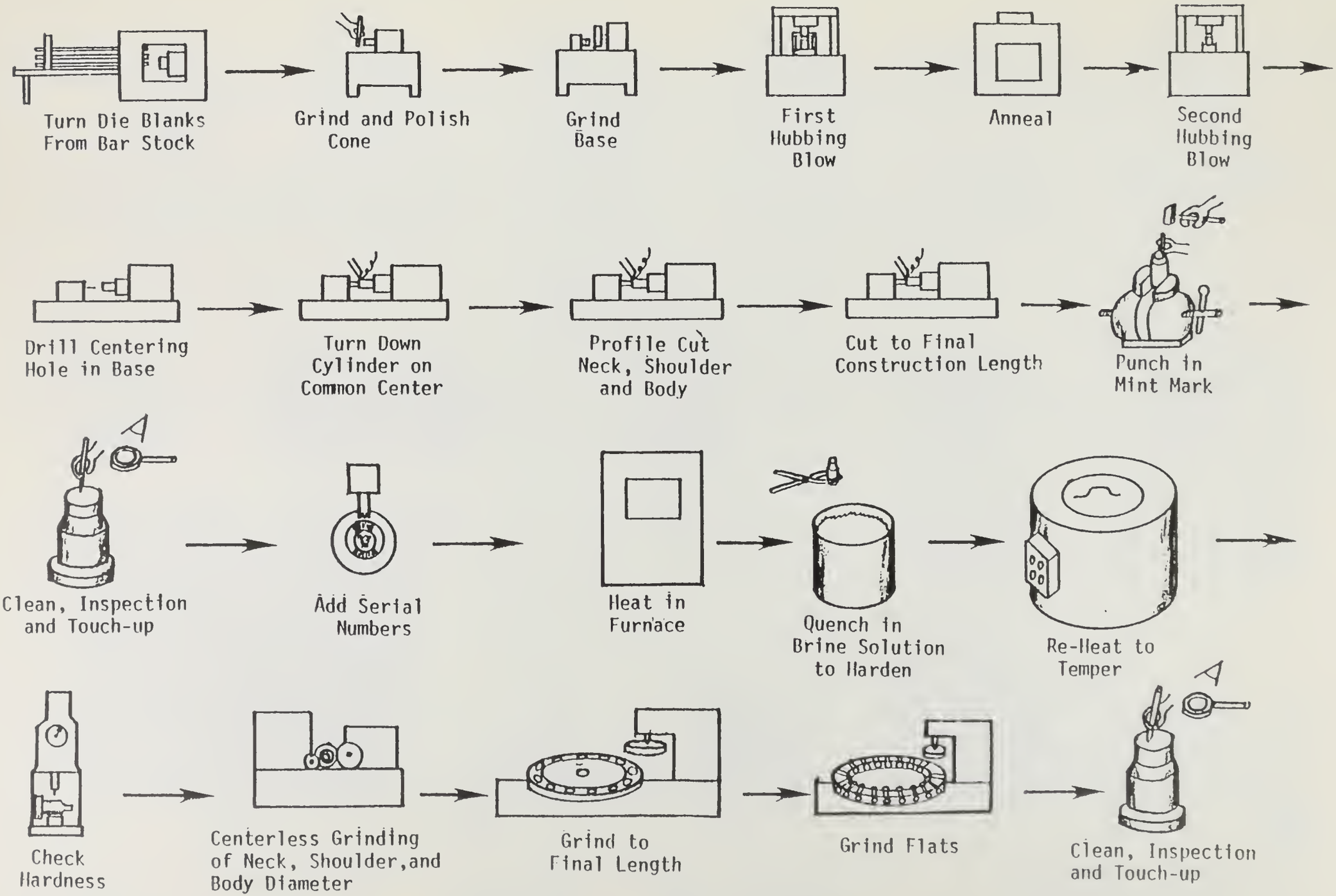
Smooth out Cutting Tool Marks on Hub

Turn Down Hub Neck and Body in Lathe

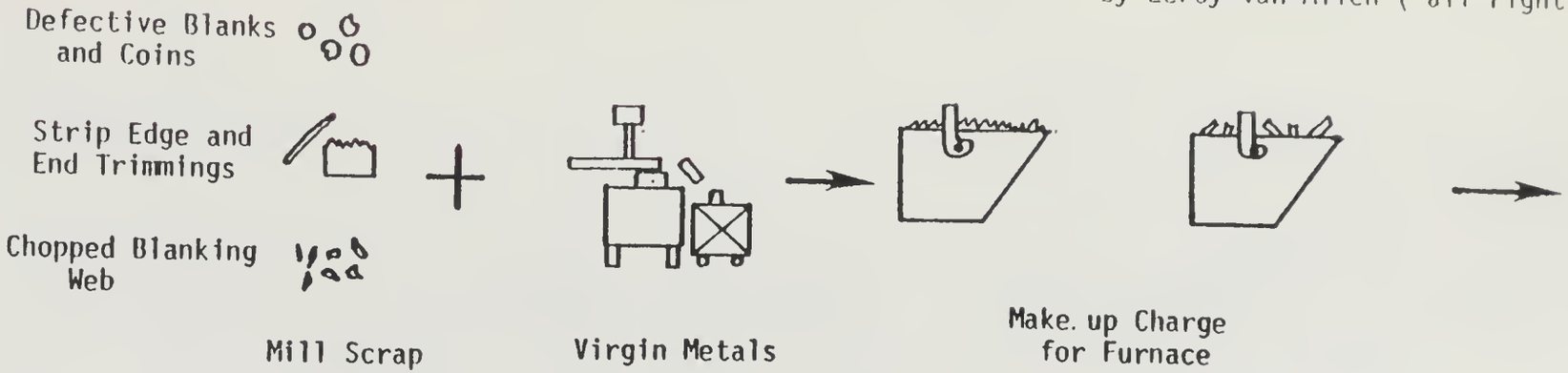
Heat and Quench to Harden

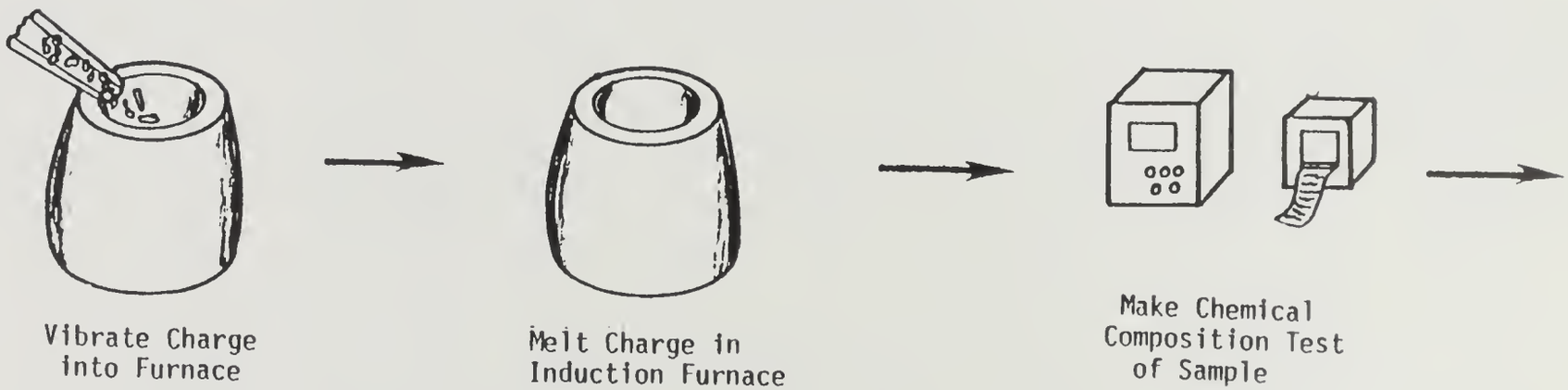
Finished Master Hub

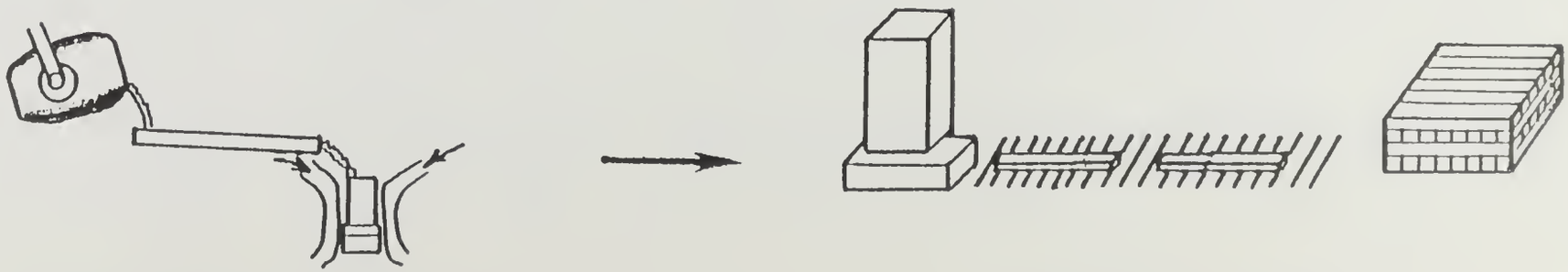
DIE MAKING STEPS



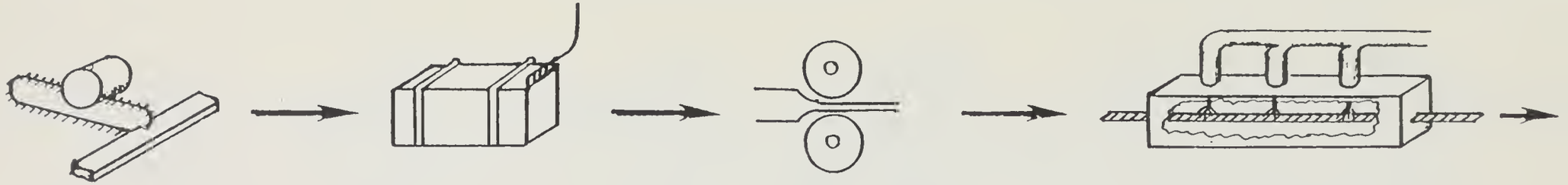
MELTING AND CASTING







STRIP PREPARATION STEPS

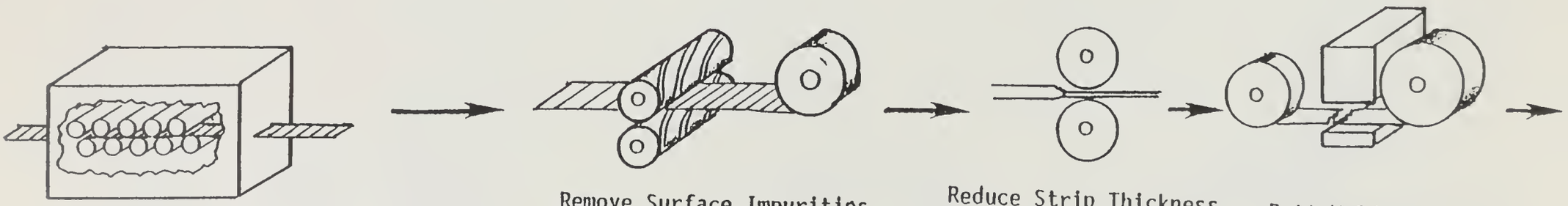


Saw Ingot in Half to Produce Billets

Reheat Billet in Induction Furnace

Reduce Billet Thickness to 3/8" in Hot Rolling Mill

Cool Strip by Quenching in Water

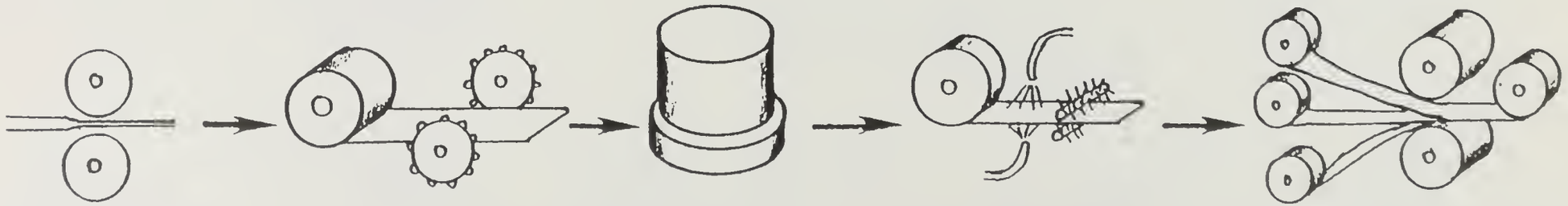


Flatten Strip in Flatner

Remove Surface Impurities in Slab Mill

Reduce Strip Thickness to 0.1 - 0.2" in Cold Breakdown Mill

Butt Weld 2-4 Strip Coils Together



Reduce to Final Strip Thickness in Finishing Mill

Trim Strip Ends and Edges

Anneal Copper and Copper-Nickel Strips Used in Clad Strips

Clean and Abraid Strips to be Bonded Together

Bond 3 Strips Together with Heat and Pressure to Form Clad Strip

COINAGE PRODUCTION AT THE PHILADELPHIA MINT

by Leroy C. Van Allen C-1424

(First of a Series)

Production, production, production - incredibly high production! This is the overall impression left with me after a visit to the Philadelphia Mint last October 4th and 5th. Accompanying me was my wife, Ruth, who took extensive shorthand notes during the tours of the various mint departments. I concentrated on asking questions, observing the process and taking photographs. All in all, it was a very exciting experience!

In a series of articles in the Errorgram over the next few months I'll give you a personal tour of the Philadelphia Mint coining department. Although we were given tours of the other mint departments including engraving, die manufacturing, melting and casting, strip preparation, medals and laboratories they are of less interest to us error collectors since they are a source of relatively few error coins.

But first let me explain how the tour came about. Alan Herbert set up the special arrangements with the Bureau of the Mint allowing us to be given a guided tour on the production floor and to talk to the superintendents of each mint department. We were free to ask any questions about the processes and to take photographs. The only exceptions were restrictions on taking photographs of the security arrangements, transfer engraving process, and the hubbing operations.

Everyone at the mint was most cooperative in giving of their knowledge and time. We wish to thank them and the Bureau of the Mint for making possible the tour. We hope to share the information collected with others through various publications.

To emphasize the production quantities, let me cite a few statistics. Total annual U. S. coinage has been around 10-12 billions coins for the past several years with production about evenly divided between the Philadelphia and Denver mints. About 21 million coins were being struck per day last fall at the Philadelphia mint, with roughly 70 percent of the output being cents.

To put this in perspective, the U. S. produces, by far, the largest amount of coins of any country in the free world. Second place Japan produces coins at slightly less than half the U. S. rate. In 1973, only three other countries in the free world produced more than a billion coins.

Another way of looking at this production is from a historical point of view. One-hundred years ago, in 1878, the total coinage of the whole year from all U. S. mints was 42 million coins or just two days current production of the Philadelphia mint. Total annual U. S. coinage first

topped 100 million in 1883, one billion in 1940, and 10 billion in 1974. With the tremendous coinage volume, it is to the Bureau of the Mint's credit that so few defective or error coins find their way to the public. This is due to the various screening and check points along the production process, particularly for cents, that I'll point out later. There is also an independent quality control department that checks production at each major step.

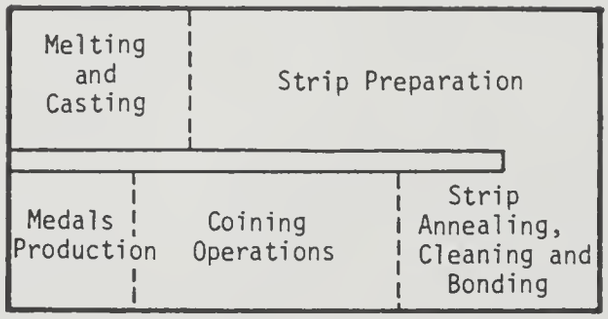
Next week we will begin the review of the overall coining process so we can follow each step covered in later installments.

COINAGE AREA

by Leroy C. Van Allen C-1424
(All Rights Reserved)
(Second of a Series)

We will now continue our tour of the Philadelphia Mint coining department with a review of the coinage area.

The Philadelphia Mint has two long, high, and parallel production rooms. The first room is 120 ft. wide, 60 ft. high and 600 ft. long and includes the melting and casting department plus the strip preparation department. The second room is 150 ft. wide, 50 ft. high and 400 ft. long and includes the strip annealing, cleaning and bonding equipment plus the coining department.



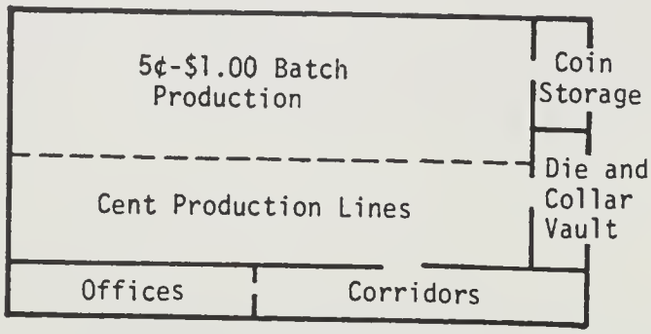
PRODUCTION FLOOR

The coinage area is about 200 ft. long and is incredibly packed with all kinds of machinery - much of it 10 to 12 feet tall! On the floor the noise of operating machinery is so high that one has to shout to someone beside you in order to be heard. Safety regulations require all workers and visitors to wear safety goggles and ear plugs at all times.

Because of the noise and clatter in the coinage area, we first spent about 45 minutes with the superintendent of the coining operations in the quiet of his office. There we discussed the general coinage operations, production rates, capacity of the various machines, and the causes of some of the defective or error coins. I'll bring out these points as we cover each phase of the coining operations.

Second in a Series

The coining area has two automated cent lines running its entire length. Batch processing of other denominations is handled in the remaining area. There is also a vault for storage of the dies and collars, a temporary storage vault for bagged coins, plus some office space.



COINING OPERATIONS AREA

On the third floor is the 600 ft. long gallery for visitors. From this gallery, continuous strip windows with wired glass sloped to avoid reflections and glare afford an excellent view of all mint production operations. The coinage area from this vantage point first appears like a great mixture of all kinds of equipment very close together. However, there are large signs posted on certain columns identifying the general coinage operations for the visitor of blanking presses, annealing furnaces, upsetting mills, and coining presses. Next week we'll look at the cent production lines.

CENT PRODUCTION LINES

by Leroy C. Van Allen C-1424

(Third of a Series)

Let's take an overall look at the cent production lines this week. Because 70 percent of the coin production is cents, the mint has two automated cent lines for maximum volume and efficiency. These two automated lines have existed since September 1968. The cent production is continuous and untouched by human hands from punching of the blanks to striking of the coins in the presses. Here, after examination of sample coins from the trap box by the press operator, the coins, if found satisfactory, are released into a conveyor. They continue automatically until taken from the automatic coin counter in bags by the operator, and the top is sewn closed.

Improvements to these automated production lines are periodically being incorporated so that certain of the processes are slightly different from the time the mint first opened in 1968. For example, the riddle to sort out defective blanks has been redesigned and a different feed basin on the presses is now used. We'll examine these in later installments.

The automated lines have the following steps: blank, riddle, weigh, anneal, clean, burnish, dry, riddle, upset, weigh, screen, coin, screen, weigh, screen, count, and bag. Each line has two blanking presses, two second riddles, two upsetters, 12 coining presses, and two sets of counters. All other steps have only one piece of equipment involved except the screens which are attached to the feed basin and the output conveyer of each press and to the counters.

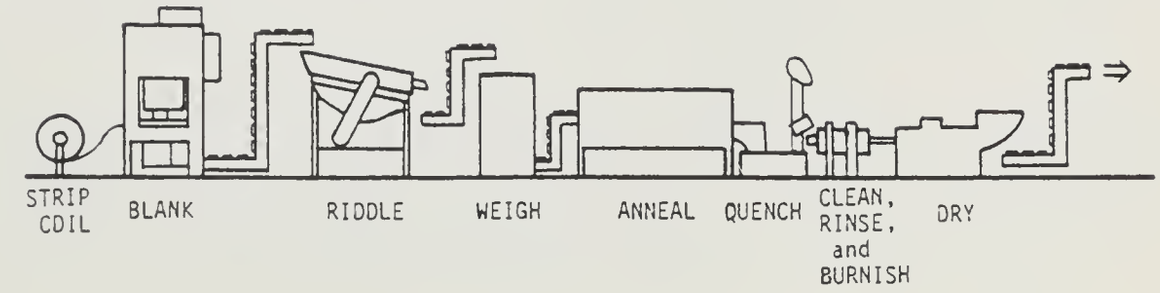
The coin striking rate of each press is about 520 pieces per minute. This is using a quad set-up with four pairs of dies per press. With 12 presses operating for two eight hour shifts, one automated cent line can produce about six million cents each day! At 5,000 cents per bag this is 1,200 bags of cents per day.

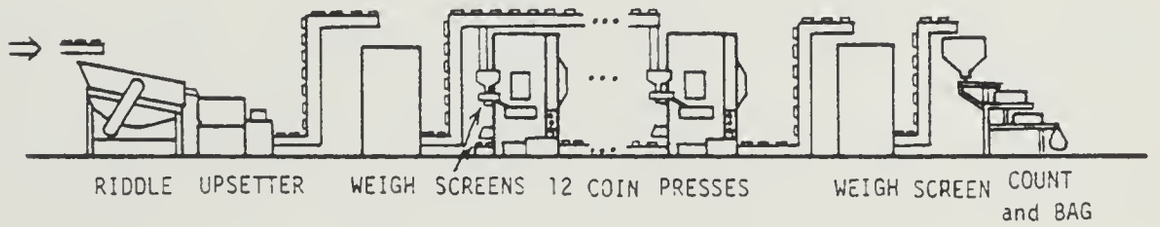
Conveyor belts take the blanks and coins from one piece of equipment to the next - up, around and over. This makes the view of cent production from the visitor's gallery spectacular with a continuous flow of glistening blanks and coins flowing from one end of the coining area to the other. It is also to be noted that the production line was neat and orderly with very little evidence of scraps of metal or loose blanks on the floor.

Each automated cent line has two riddling steps and one screen step to remove defective blanks and two screen steps to remove defective coins. As a result, only an extremely small percentage of defective cents ever reach the public. These riddling and screen steps will be described in detail in later installments.

Cents are weighed at three points in the production line for security reasons to determine that the amount of blanks going into each major section of the production is the same as is going out.

Next week the batch processing coining steps will be reviewed.





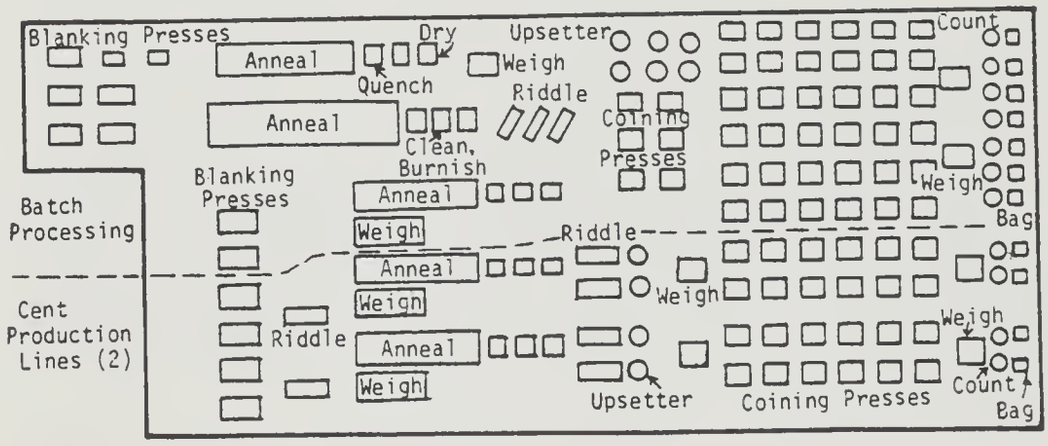
AUTOMATED CENT PRODUCTION LINE

BATCH PROCESSING PRODUCTION

by Leroy C. Van Allen C-1424
(All Rights Reserved)
(Fourth in a Series)

All the 5, 10, 25 and 50 cent plus one dollar denominations are produced by what the mint calls batch processing. That is, the blanks and coins are moved from one piece of equipment to the next via tanks rather than conveyor belts. Although it is obviously not as efficient as the automated cent lines, it does allow the flexibility to shift from one denomination to another as the need arises at any step in the production line. It also increases the chance of a mixup in the blanks but the screen in the bowl feeder of the presses should eliminate the over and undersized blanks.

The batch processing production area was of course not as neat and orderly as the automated cent lines. There were many tanks used in the transfer steps sitting around both empty and full. The sequence of operations was not as evident because of the tank transfer used between equipments. Also, there were many more loose blanks on the floor which was unavoidable because of the tank transfer steps.



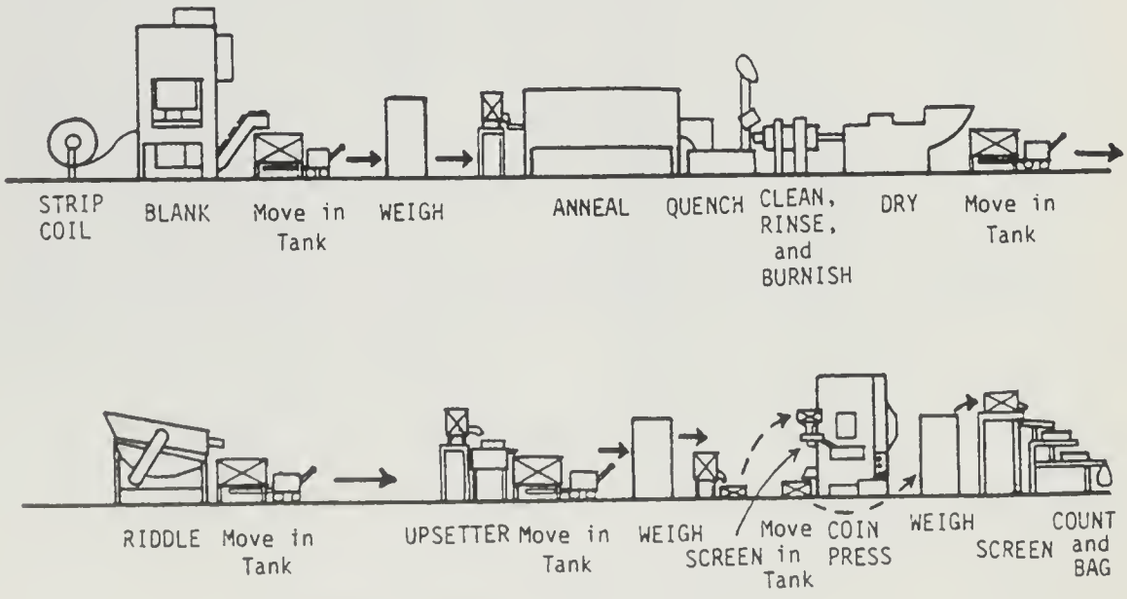
EQUIPMENT LAYOUT FOR COINING OPERATIONS

Roughly two-thirds of the production floor was devoted to the batch processing production. It was laid-out in about the same sequence as the cent production lines. But of course, there was more space around each piece of equipment to allow the unloading and loading of the transfer tanks.

These transfer tanks were of a standardized size of roughly two and one-half feet wide, four feet long, and three and one-half feet high. They were covered with a hinged lid and had sloping bottoms to a trap door on the long side for release of the blanks and coins. The tanks had a metal framework underneath them so that they sat about ten inches above the floor. A motorized lift was used to move the tanks about and lift them into place at each equipment.

The batch processing production consisted of the following steps: blank, move in tank for hand loading, weigh, anneal, clean, burnish, dry, move in tank, riddle, move in tank, upset, move in tank, weigh, load into press boxes, screen, coin, move in tank, weigh, screen, count, and bag. Only one riddle is used in the batch processing, but each coin press also had the special screen in the feed basin as did the cent press.

If you've borne with us so far in this series through this general background, we'll finally get to some specific equipments next week starting with the blanking presses.



BATCH PROCESSING PRODUCTION

BLANKING PRESSES

by Leroy C. Van Allen C-1424
(All Right Reserved)
(Fifth of a Series)

This week we'll start describing the operation of the equipment used at the Philadelphia Mint coining department. At first sight of the blanking press one is surprised at its huge size! It stands about twelve feet high and roughly six by eight feet on the sides. Into one side feeds the strip roll to be punched with the blanks ejected at the bottom into a conveyor belt. The web of the blanked strip feeds out of the other side into a scrap chopper which cuts the web into small pieces for ease of handling. This scrap is returned to the make-up section of the melting and casting department for use as part of a melt make-up.

The Philadelphia Mint has a total of eleven 150 ton blanking presses and two 100 ton blanking presses. The blanking stroke rate is amazingly fast! For cents it is 250 strokes per minute or better than four per second! All other denominations have a blanking rate of 200 strokes per minute.

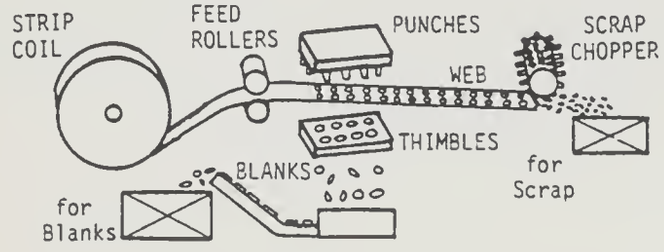
The length and weight of the strip coils vary with the denomination. Strip thicknesses for U. S. coins are: 1¢ - .0495, 5¢ - .0635, 10¢ - .041, 25¢ - .0535, 50¢ - .0685, and $1.00 -.089 inches. Strip widths are 12-11/16 to 15-1/2 inches. Length of a coil can be over 3,000 feet and the weight can be up to ten thousand pounds.

Each denomination has a different quantity of blanks punched out per stroke of the blanking press as follows:

1¢ - 22 per stroke	25¢ - 15 per stroke
5¢ - 18 per stroke	50¢ - 10 per stroke
10¢ - 21 per stroke	$1.00 - 8 per stroke

Blanking rate is as follows for each press:

1¢ - 5,500 blanks per minute	25¢ - 3,000 blanks per minute
5¢ - 3,600 blanks per minute	50¢ - 2,000 blanks per minute
10¢ - 4,200 blanks per minute	$1.00 - 1,600 blanks per minute



BLANKING PRESS OPERATION

The strip from the coil is advanced into the blanking press by feed rollers. The punches ganged together on the upper base are forced down through the strip into the thimbles on the lower base with matching holes for each punch. The punch, in combination with the thimble, shears the blanks or planchets out of the strip. Air injectors in the punches force the blanks off the punches and out of the thimbles. They then fall into a collection box and are removed by a conveyer belt to tanks or the cent conveyer system.

The web continues through the blanking press and out the side to a scrap chopper placed next to the press. This shreds the web into bits and pieces less than an inch long and places this scrap into a collection tank.

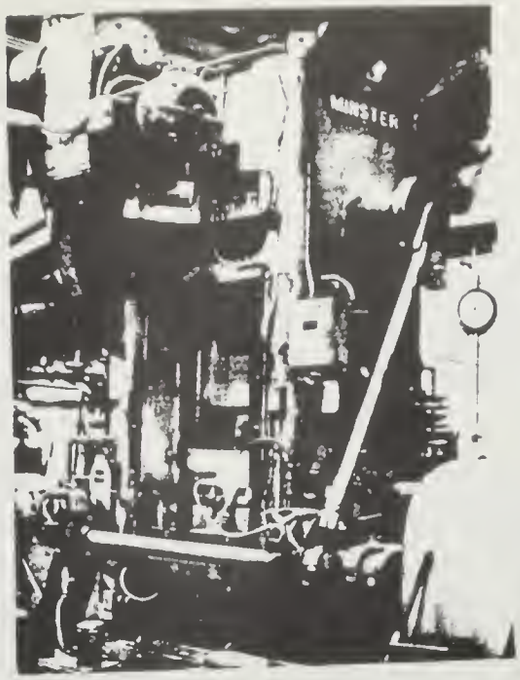
There are a number of defective planchet types that can be produced at this point well known to error collectors including curved clips, straight clips, ragged edge clips, and multiple clips. Single curved clips are due to overlapping punches of a strip and are caused by failure of the strip to advance properly into the press. The feed rollers sometimes slip if there is too much oil on the strip.

A straight edge clip is obtained at the end of a strip. Normally, the blanking press is stopped at the last six feet or so of a strip coil. But if the press operation is not stopped in time, then the punches would overlap the strip end producing the straight edge clips.

Ragged edge clips are caused when breaks on the edge on the strip haven't been trimmed off properly and extend into the blanking area of the strip.

Multiple clips are blanks with more than one cut out of it. They are caused by the machinery hanging up somewhere and not functioning properly. The blanks are sometimes pulled up through the thimble and stick to the bottom of the punch because of too much oil. Air injectors within the punches normally keep the blanks from sticking to the punch. A blank thus raised above the punched strip can fall back on top of the strip and be punched again several times before falling down through the thimble. In the blanking press that I examined in operation, there were several blanks that had been carried through the mechanism and onto the platform outside the punch and thimble area. The clearance of the exit slot out of the punch and thimble area was at least twice as thick as the strip material. So blanks sticking to the punches can rattle around inside the punching area to receive multiple clips.

Next week we'll cover the riddle operation.



150 TON BLANKING PRESS

RIDDLE

by Leroy C. Van Allen C-1424

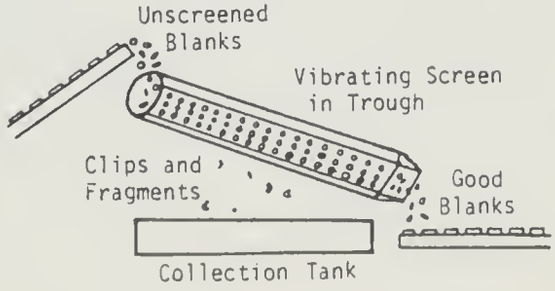
(Sixth in a Series)

There are a total of four riddles in the automated cent lines with two in each line. They are all of the same basic design that separate out the undersized blanks, clips and fragments. Three riddles are used for the batch processing production of the other denominations.

A riddle consists of a slightly inclined trough about eight feet long with holes in it to form a screen. A motor and mechanism is used to vibrate the trough. Enclosing the trough is a stationary framework and stand. At the Philadelphia Mint the holes in the riddle screen are slightly smaller than a good blank.

In operation, the blanks are poured onto the top of the riddle trough either from a conveyor for cents or out of the trap door of the tanks for the other denominations. As the blanks are vibrated down the slightly inclined riddle trough, the undersized and clipped blanks fall through the holes that are slightly smaller than a good blank. The good blanks continue down the trough on top of the screen exiting via a chute to the conveyor belt or tank.

RIDDLE



RIDDLE OPERATION

Of course there is a small finite chance that a defective blank will somehow slide down the trough and not fall through the screen. Certain circumstances of bounces and jumps may cause the defective blank from hitting any hole in the screen on its way down the trough length. So a few defective blanks inevitably pass through the riddle. The cent line has two riddles in each line to reduce the chance of this occurring so that even though billions of cents are made, only a very small number are made with defective planchets.

The riddles for the denominations above the cent are slightly different. There are two screens in each riddle with two exit chutes. As a result, one riddle can serve for two denominations. For example, one riddle configuration has a dollar screen on top and a 50 cent screen on the bottom. The dollar exit chute on top curves to the right and passes the good dollar blanks that did not fall through the top screen. The 50 cent exit chute on the level of the lower screen curves to the left and passes the good 50 cent blanks that have fallen through the top dollar screen and not through the lower 50 cent screen. In operation, the tank of unscreened blanks is placed above the head of the riddle trough and the trap door opened with a funnel guiding the blanks to the head of the trough. A lower tank is placed under the appropriate exit chute to collect the good blanks.

After being riddled, the cent blanks are automatically weighed in 400 lb. lots.

Next week we'll examine annealing of the blanks.

ANNEALING FURNACES

by Leroy C. Van Allen C-1424
(All Rights Reserved)
(Seventh in a Series)

There are four annealing furnaces with 4,000 lb/hr capacity and a newer one a few years old with 8,000 lb/hr capacity. One 4,000 lb/hr annealing furnace is used in each of the cent production lines. These furnaces soften the blanks to facilitate their later striking in the coining presses. The blank material is hard due to the work-hardening process from the strip rolling operation (negligible hardening from punching).

The annealing furnaces are gas-fired rotary retort type. The 4,000 lb/hr. furnace contains a rotating cylinder approximately 40 feet long. A six inch high spiral inside this cylinder turns the blanks over while they traverse its length.

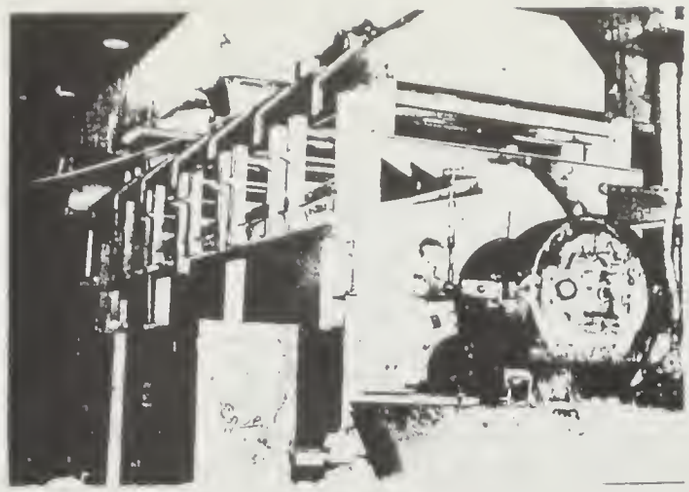
The annealing time and temperature varies with the blank demonination. Cents stay in the furnace for 22 minutes and reach a temperature of 1300°F. Nickels stay in for 30 minutes and reach a temperature of 1600°F. Clad metal blanks remain in the furnace between these two time durations depending upon the denomination and reach a temperature of 1480°F. The blanks are not at the full temperature the entire time they are in the furnace since there is a time lag for them to heat up.

After the blanks have been held at the proper annealing temperature for a sufficient length of time, they are immediately quenched in a tank. The quenching tank solution is water with a handful of soap chips. The heated blanks are not exposed to air while still hot since this would cause surface oxidation. There is an enclosed hood at the end of the annealing furnace extending down to the quenching vat to protect the hot blanks from the air. Quenching the hot blanks quickly to room temperature softens them unlike ferrous metals where quenching is used to harden the metal.

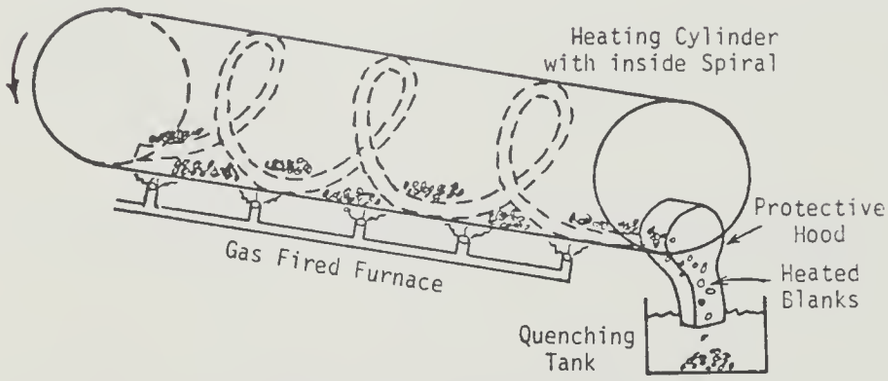
After the blanks have been annealed a sampling is taken from the quenching vat for a hardness test. A Rockwell Hardness Tester is used to measure the hardness of the sample blanks. There is an allowable hardness range for each coin denomination. The blanks are never too soft but sometimes they are too hard due to inadequate annealing. If a batch of blanks is found to be too hard, then the annealing furnace is adjusted and the defective batch is annealed again.

The 8,000 lb/hr annealer initially did not turn the blanks over so that some in the middle were not properly annealed. A modified spiral design cured this problem.

Next week we'll look at the cleaning and drying operations.



ANNEALING FURNACE



ANNEALING FURNACE OPERATION

CLEANING AND DRYING

by Leroy C. Van Allen C-1424

(Eighth in a Series)

At this point the blanks have a coating of burned oil, dirt and metal particles accumulated from the strip preparation and blanking processes. They are dark in appearance and need to be cleaned and brightened prior to being struck in the coining presses. Any foreign material left on the blanks during the striking would detract from the resulting coin's appearance and it would also accelerate the die wear.

The cleaning, rinsing, and burnishing operations are all performed in a large revolving drum about eight feet long and six feet in diameter. A skip hoist is used to transfer the blanks from the quenching tank to the cleaning drum in batches of about 4,000 pounds.

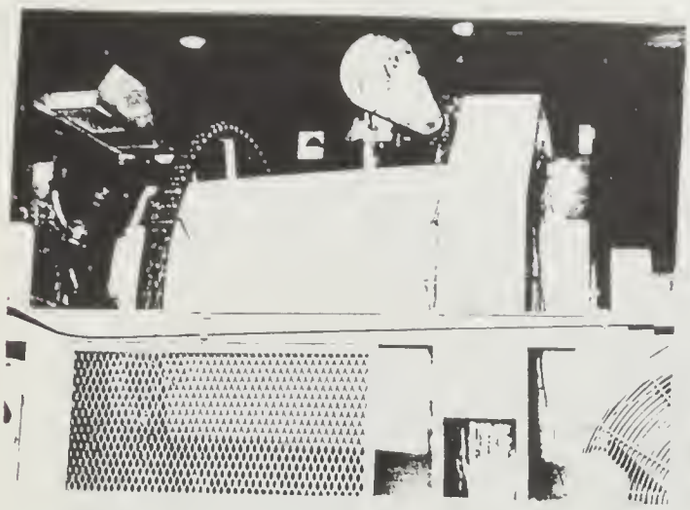
Once inside the revolving cleaning drum, the blanks are washed in the bottom with a hot caustic solution and soap compounds. A separate holding tank about eight feet in length is used to cycle the cleaning solution in and out of the cleaning drum.

Next, the cleaned blanks are rinsed in warm water to remove all traces of the cleaning solution. Otherwise, a film would be left on the blanks resulting in a mottled or dull appearance on the surface of the resulting coins.

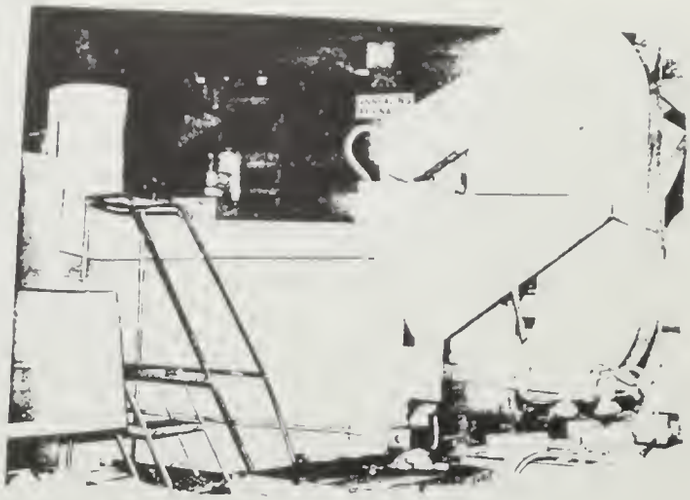
At the same time the blanks are subjected to a self-burnishing action. As the blanks are being rinsed they tumble inside the revolving drum brushing against each other. This creates fine scratch marks and brightens their surface removing any last traces of surface oxidation to create virgin metal surfaces. These fine burnishing marks disappear when struck under the force of the dies in the coin presses.

After the blanks are thoroughly rinsed and burnished, the cleaning drum reverses its rotation. A spiral inside picks up the blanks and lifts them into a transfer tube to the drying drum. Here the blanks are dried using forced hot air as they pass through another revolving drum inside a chamber about ten feet long.

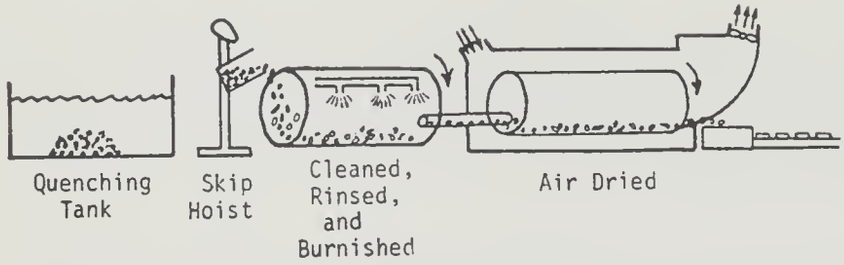
Next week we'll treat the upsetting step.



CLEANING, RINSING,
AND
BURNISHING DRUM



DRYING DRUM



CLEANING AND DRYING OPERATIONS

UPSETTING MILLS

by Leroy C. Van Allen C-1424

(Ninth in a Series)

After the cleaning and drying operation, the cent production line splits into two parallel segments, each consisting of another riddle and an upsetting mill. These riddles are the same design as the one used after the blanking operation but slightly shorter in length. The output of these riddles dump into a collecting bin which feeds into the upsetting mill below. The batch production line has its one riddle operation also just before the upsetting step. There are six upsetting mills in the batch processing area.

The collecting bin above the upsetting mill has two outputs at the bottom which feed on either side of the upsetting mill. Blanks enter the mill from opposite sides so that two streams of blanks are processed simultaneously. Upsetting rates are approximately the following per side: cent - 1,800 per minute, nickle - 1,500, dime - 2,100, quarter - 1,300, half dollar - 700, and dollar - 400.

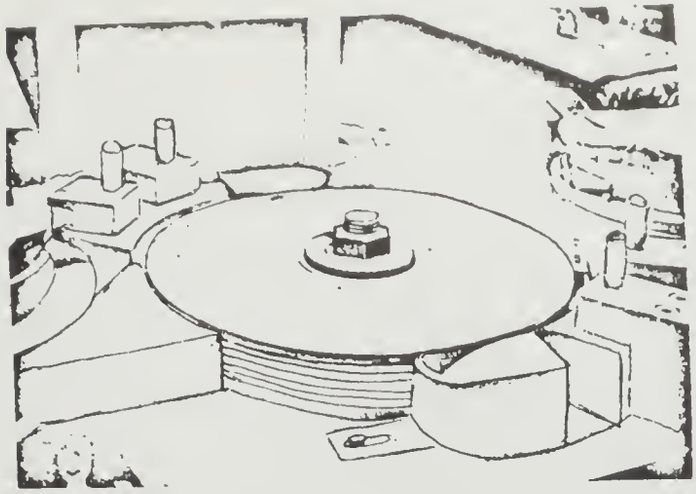
The purpose of the upsetting mill is to produce a raised edge on the blanks. This work-hardens the edge of the blank and reduces any tendency for finning on the coin rim. Finning is a vertical flange of metal on the outer edge of the rim caused by the blank material flowing between the side of the die neck and the collar. Upsetting also makes the blank edge smoother and the diameter more consistent to promote better feed finger operation in the presses.

The design of the upsetting mill is very simple. It consists of a metal disc about a foot in diameter with six grooves around its edge. Close to the edge of the disc is a short curved metal block about six inches long also with six grooves facing the disc. The distance between this curved block and the disc is slightly closer at one end than the other.

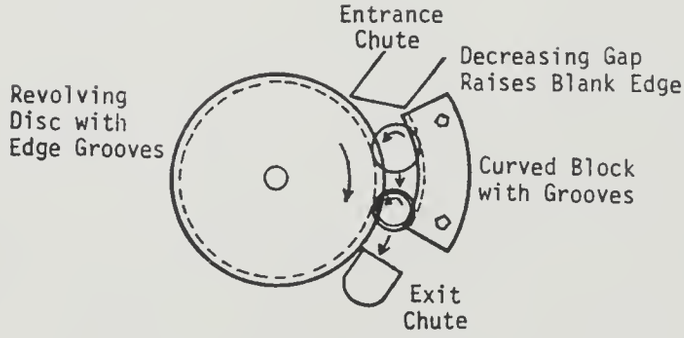
In operation, the blank (Type I without raised rims) simply enters into opposing grooves of the disc and curved block. The revolving disc turns the blank and it progresses down the length of the curved block and out the other end. The blank edge is rolled or upset by the force between the revolving disc and curved block as the separation distance becomes smaller over the length of the curved block.

A feeder chute enters the blanks between the disc and curved block. A receiving chute catches the blanks (Type II with raised rims) with raised edges as they are ejected from the curved blocks and then fall down into the conveyer belt or a collection tank. The cent blanks are then again automatically weighed in 400 lb batches.

Next week the coining operations will finally be examined. This will take several weeks because of the many steps involved in this operation and of the interest to error collectors on possible ways error coins are caused.



UPSETTING MILL



UPSETTING MILL OPERATION

COINING PRESSES

by Leroy C. Van Allen C-1424
(All Rights Reserved)
(Tenth in a Series)

The coining press area is truly jam-packed with row upon row of presses busily striking the coins. Most rows have six presses side by side with only four or five feet spacing between rows. The newer Bliss made presses are huge standing about ten feet high and about five feet on each side, costing around $60,000 each.

There are currently 72 coining presses in the Philadelphia Mint coining area, of the following types and striking pressures:

55 Bliss # 6 K-225	200/225 tons
12 Old mint type	360 tons
3 Old mint type	180 tons
1 Taylor Challen	200 tons
1 experimental	250 tons

The overall impression is that the coining area would be hard pressed to sandwich in even one more coining press. Because of this, the West Point Bullion Depository is being used for supplemental cent production.

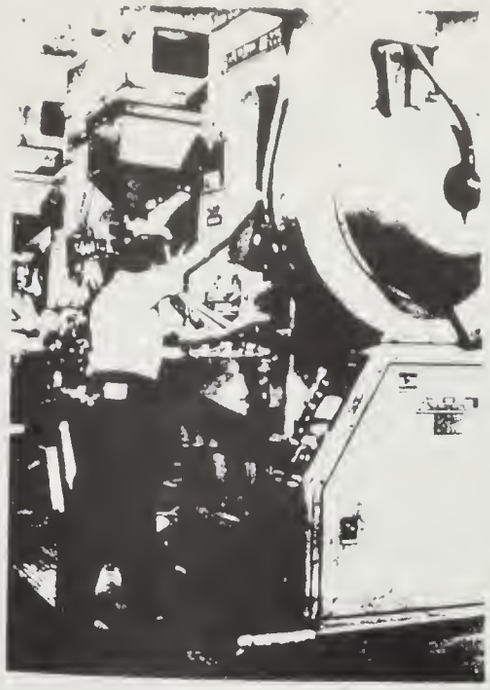
Cents, nickels, and dimes are struck four at a time in a press. Quarters and halves are struck two at a time with dollars one at a time. The pressure required to strike each coin denomination is as follows:

1¢ and 10¢	35-40 tons per piece
5¢	55 tons
25¢	80 tons
50¢	110 tons
$1.00	170 tons

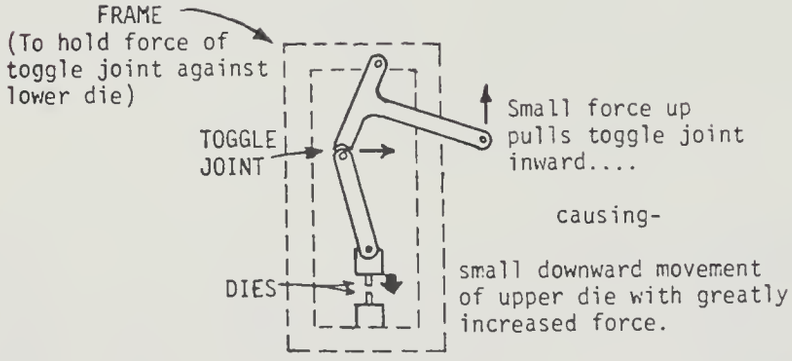
This is the pressure required to bring the design up satisfactorily on the coin without excessive die wear. The striking rate is about 120 strokes per minute varying slightly with the coin denomination and type of press. Average striking rates are as follows: cent - 130 strokes per minute, nickel - 120, dime and quarter - 130, half dollar - 120, and dollar-110.

The Bliss coining press uses a knuckle drive to a straight ram with an eight point contact. It uses the same basic principles of design to achieve the high pressures required as the other mechanical presses. The principle of the knuckle drive or toggle joint has been in use for coin presses since the early 1800's. It relies on the tremendous mechanical leverage obtained by the sideways movement during the straightening of the joint between two straight rods. As the joint approaches the point of being straightened, the vertical length of the two rods changes less and less which increases the mechanical leverage. Thus, the force used to push the toggle joint sideways is multiplied many-fold into the vertical direction.

Next week we'll examine the operation of the feed fingers and dies in the coining press.



COINING PRESS



PRINCIPLE OF TOGGLE JOINT/KNUCKLE DRIVE

OPERATION OF DIES AND FEED FINGERS

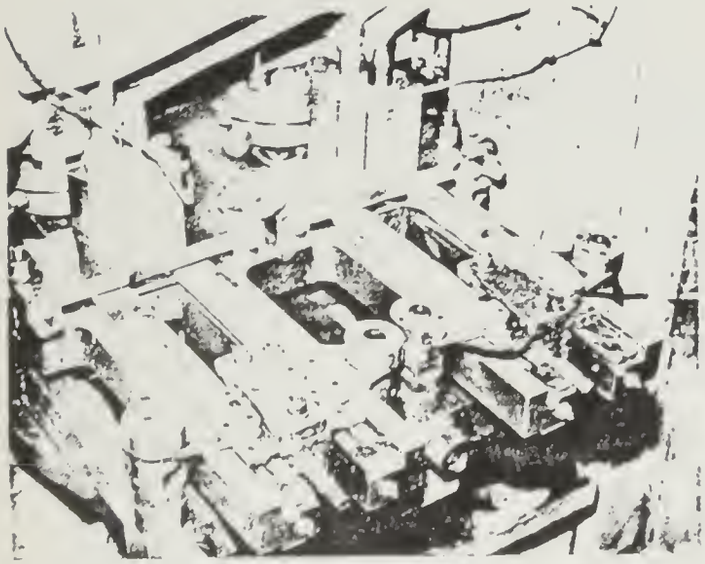
by Leroy C. Van Allen C-1424

(Eleventh in a Series)

Beside striking the coin the lower die performs another important function. After the coin has been struck the lower die raises about an eighth of an inch to push the coin up out of the collar. This is necessary since the coin expands outwards against the collar when struck under the tremendous pressures. Thus, the coin is slightly wedged in the collar after being struck and would not fall out.

The feed fingers perform two functions of laying the blank into the collar and pushing the newly struck coin off the lower die when it has risen above the collar.

In operation, the feed chutes drop the blanks into the feed fingers. The feed fingers consist of two long arms which pivot together gripping the blank between a semi-circular cutout. Then the feed fingers advance between a raised upper die and a dropped lower die. As the feed fingers pivot apart, the blank drops down into the collar to rest on top of the lower die. The feed fingers then retract back out from between the dies. The upper and lower dies come together on the blank impressing the obverse and reverse designs and causing the metal to flow sideways against the collar. The upper die raises up first and then the lower die raises up slightly to push the coin up out of the collar. Then the feed fingers advance with a fresh blank simultaneously pushing the newly struck coin off the raised lower die into the ejection chute with the ends of the feed fingers.



FEED FINGERS AND
UPPER DIES IN PRESS

FEED FINGERS
AND COLLAR

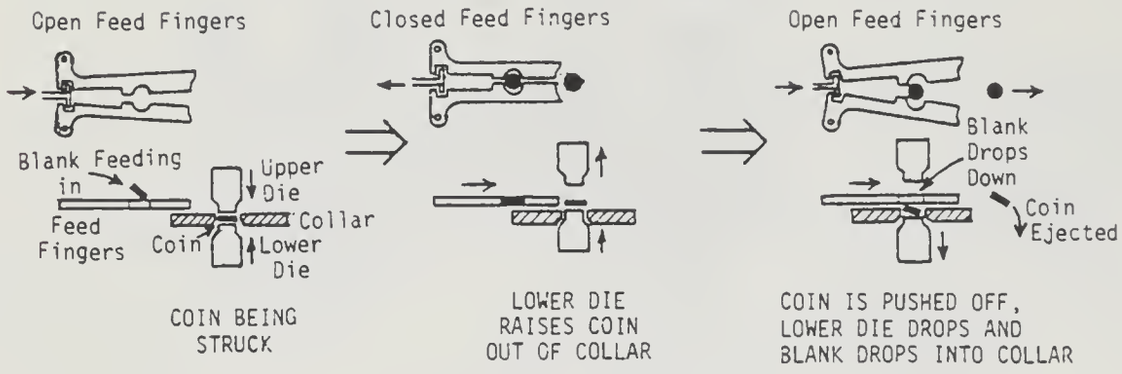
Dies are mounted in a die fixture to locate them in one position and orientation. The die fixture is in turn placed in a holder which is attached to the press mechanism.

Two each of the dual die types (cent, nickle, and dime) are placed in one die fixture. Holes in the die fixture are on the same center distances for all dual die denominations, but are of different diameters to accommodate the different diameter dies. Flats on the lower shank of these dual dies are placed against each other. This positively locks the dies in one position so they cannot rotate. Grooves and flats on the die fixture lock it in one position in the holder.

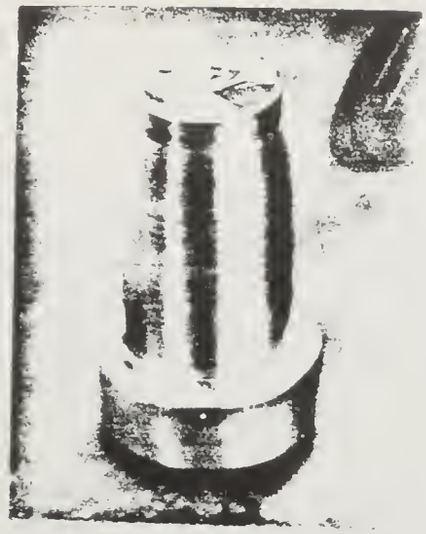
There is only one die per fixture and holder for the quarter, half dollar and dollar dies. Flats on the die bodies of these denominations are placed against a key in the die fixture to determine their orientation

There are now standardized dies and adjacent tools within the presses for all U. S. mints and minting facilities. The interchangeability program of dies and tools was instituted about seven years ago.

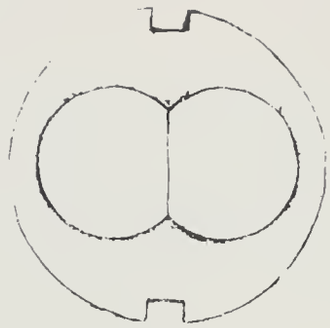
Next week we'll cover the set-up and operation of the coining presses.



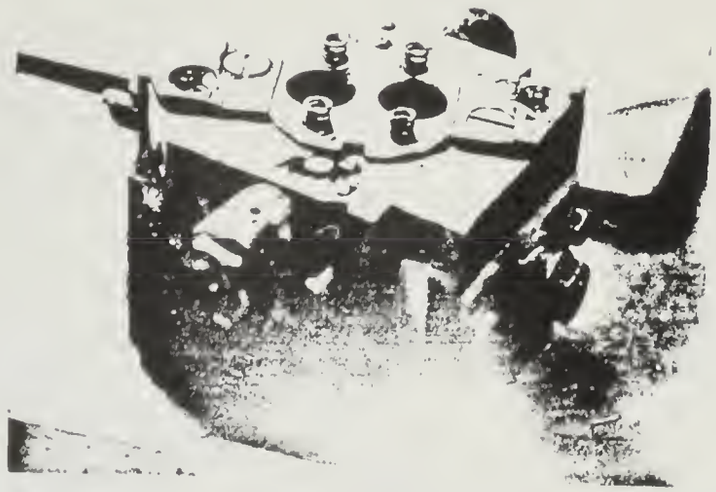
FEED FINGER AND DIE OPERATION



DIE



FLATS OF DIE TOGETHER
IN DIE FIXTURE



DIE FIXTURE IN
PRESS HOLDER

COINING PRESS OPERATION

by Leroy C. Van Allen C-1424

(Twelfth in a Series)

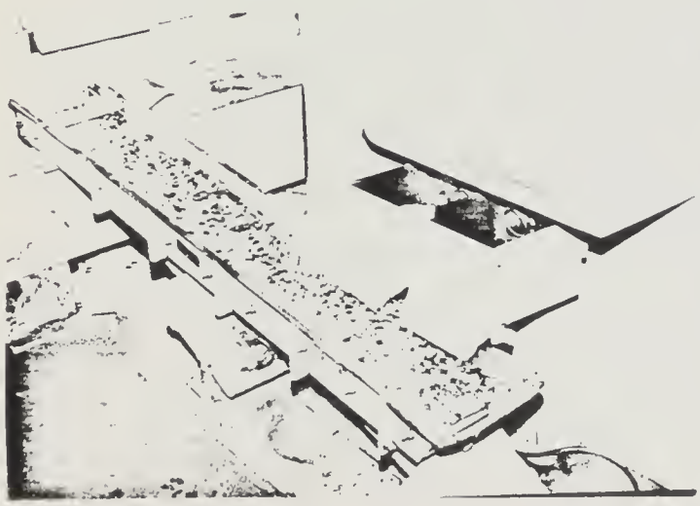
A line of six presses is operated by one press operator. As the coins are struck, they accumulate in a trap box at the bottom outside of the press. There are two of these boxes on the Bliss presses with a dual or quad die set-up. They are about ten inches long, eight inches wide and eight inches high.

The press operator will take several coins from the top of the trap box when it is nearly full. He examines the coins with a seven power magnifying glass under an incadescent lamp on the press. He looks for defective coins such as ones with die cracks, die clashes, and light strikes or errors such as off-centers, multiple strikes or defective planchets. If he finds any errors, he condemns the whole batch in the trap for remelting. There is also a roving inspector from the mint Quality Control Department who periodically inspects the coin output from the presses.

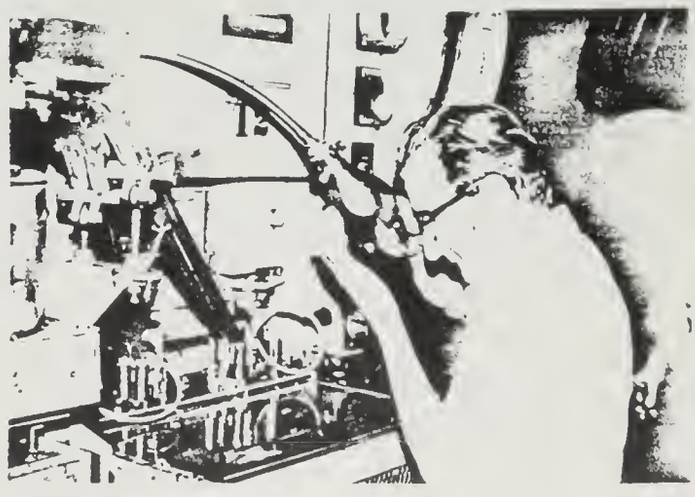
If the coins are satisfactory in the trap then the press operator opens the trap door and allows them to fall onto a vibrating screen over a conveyer belt for the cents or into a bin for other denominations. The bin is periodically emptied into a transfer tank.

Periodically, the dies and/or collars have to be replaced in the coining press after they wear out. The life of the dies and collars has an approximate average range as follows:

	DIES	COLLARS
1¢	1,000,000 - 1,700,000 coins	12,000,000
5¢	300,000 - 500,000	3,000,000
10¢	250,000 - 400,000	2,500,000
25¢	250,000 - 500,000	2,500,000
50¢	200,000 - 500,000	4,000,000
$1.00	100,000 - 200,000	500,000



PRESS TRAP BOX
AND CONVEYOR SCREEN



PRESS OPERATOR
EXAMINING COINS

The initial adjustment of a new set of dies and collar is performed by a die setter. They have to make sure that the dies are oriented and centered properly with the correct pressure to strike the coins. A multiple die holder or fixture has two holes for the dies that have to be maintained on center between the obverse and reverse dies. To check the die centering, the die setter places paper between the dies and it is pressed just enough to imprint it. The paper is then taken out and examined to see how well centered the dies are.

Test strikes are also made by the die setter to set the proper striking pressure. These test coins are set aside to be remelted.

The most critical thing used in the coining process are the dies. They are stored in a locked die and collar vault. They must be checked out by the die setter who signs for them on a record card. When the dies have worn out, they are destroyed by the mint. Four people must witness the destruction of unusable dies and three of these have to be from outside the coining department.

In the next installment the important functions of the feed basin will be examined.

FEED BASINS FOR COINING PRESS

by Leroy C. Van Allen C-1424

(Thirteenth in a Series)

Why do the feed basins deserve special treatment, you're probably wondering. The feed basin for the coining presses at the Philadelphia Mint are of a special design and perform several special functions. They have been used at the Philadelphia Mint for the past ten years and at the Denver Mint for the past two years. The feed basin not only introduces the blanks into the feed chute down to the feed fingers but it also applies a light coating of oil to the blanks and serves to screen out the over and under sized blanks. These last two functions are of special interest to error collectors since they are a source of or a way to eliminate error coins.

The feed basin consists of a bowl about 16 inches in diameter and six inches high. It vibrates, causing the blanks to parade around the bottom of the bowl. Near the edge of the bowl are exit holes where the blanks fall one at a time into a flat chute and slide down to the feed fingers.

Of course, the primary function of the feed basin is to take blanks from a pile and feed them sequentially one at a time into the feed chutes. The vibrating basin keeps the blanks in a sort of fluid mechanical state. This assures that a constant supply of blanks is over the exit holes in the basin and that they freely flow or drop through the pan into the basin without piling up or creating voids over the holes.

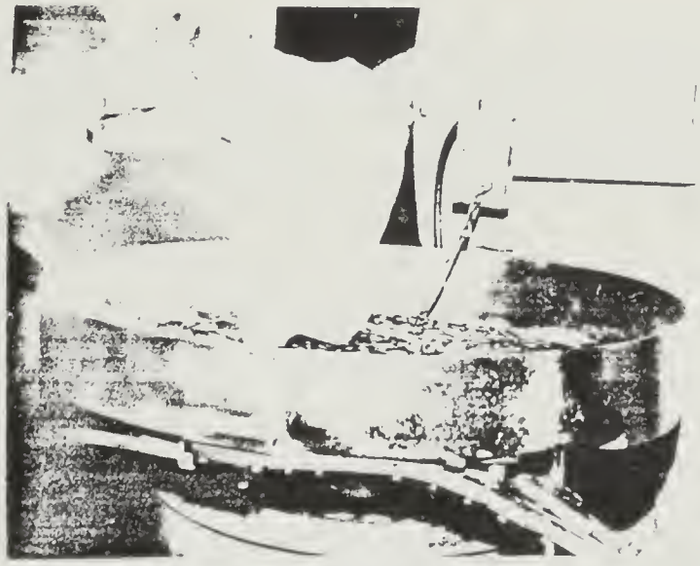
To work efficiently, the feed basin has to be supplied with a proper flow of blanks into it so that the pan in the bottom is entirely covered with blanks to a depth of one-half to one inch. To see how this is done we must back up one step in the operation. Each of the cent presses has a large chute dropping down from the overhead conveyer belt for blanks. A portion of the blanks in the conveyer belt is siphoned off to each press in this manner. The chute ends in a holding bin of about two feet high and 18 inches on each side. Presses for other coin denominations have blanks put in this bin in batches. The bottom of the holding bin is tapered inward ending in a vertical tube about four inches on a side. This exit tube of the holding bin is directly over the feed basin so that the blanks drop down onto the center of the vibrating basin. A lever on the side of the feed basin measures the depth of the blanks in the basin bowl and electrically controls a vibrator at the bottom of the holding bin to achieve the proper flow of blanks into the feed basin.

The exit holes in the feed basin have a special screen. The diameter of the top hole from the basin into the feed chute is such that it just passes blanks of the proper size. Directly underneath this exit

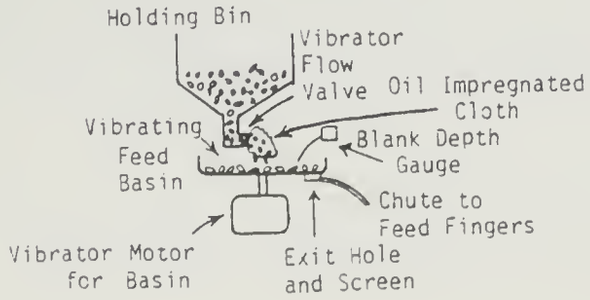
A thin film of oil is also applied onto the blanks by the feed basin. As the blanks exit from the holding bin tube they each hit against an oil soaked cloth as they drop into the feed basin. This cloth is saturated with a mineral oil in a volatile carrier. Ten percent of the oil remains on the resulting coins. Too heavy an oil film on the blanks impedes the coining operation causing weak areas on the coin design due to oil incompressibility. On the other hand, if the blanks are struck dry, then the dies wear rapidly. The objective is to have the blanks glazed over slightly with oil from the oil impregnated cloth.

Other methods were tried to put the thin oil on the blanks but the ingeniously simple oil soaked cloth has worked best. As the blanks are vibrated against each other in the feed basin, the oil spreads evenly over all surfaces of the blanks.

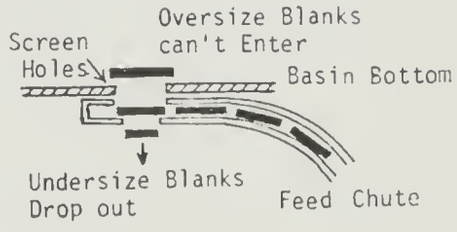
Next week we'll review how some of the major striking varieties/ errors occur.



FEED BASIN



FEED BASIN OPERATION



SCREEN IN FEED BASIN

LIGHT STRIKES

by Leroy C. Van Allen C-1424

(Fourteenth in a Series)

While in the office of Superintendent of the Coining Department at the Philadelphia Mint in October, 1977, we had a chance to ask about how various coining varieties and errors are caused. The percentage of defective coins is extremely small but with the huge production, some reach the hands of collectors. With the background provided by previous installments on the coining process, the answers given by the Mint should require little additional explanation at this point.

Light Strikes - (Mint comment) When the die setter initially sets up the coin presses, a couple of light strikes are produced. These are test pieces and are normally condemned and re-melted. The main cause of light strikes would be oil or dirt in the die. Too much oil gets gummy and builds up in the die design and lettering. When this happens, the dies are cleaned by hand with a wire brush.

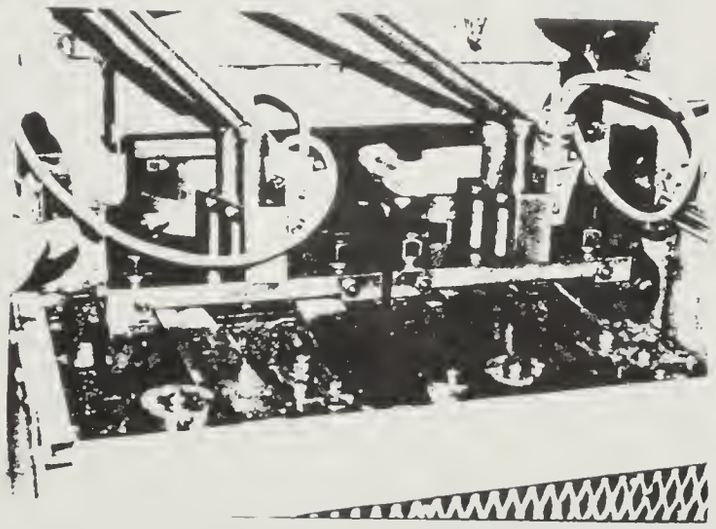
(My observation) Related to too much oil on the dies is grease of the press falling onto the dies. Of course grease is required to lubricate the various moving mechanisms of the coining press. It was very much evident around the feed finger sliding platform as a thick black residue on the sliding surfaces. Accumulations of this grease were also noted on the sides and in the corners of the mechanisms. It is not pure grease but is a thick viscous mixture of grease, dirt and metal filings. To help prevent this "grease" and other foreign objects from falling in to the die area, there were thick cloth rings installed around the upper die to act as shields.

(Mint comment) If the blanks or planchets are too hard because of improper annealing then light strikes can also occur. The annealing furnace operators have to check some blanks out of each batch annealed for hardness. (As previously pointed out, the 8,000 lb/hr annealer initially did not turn the blanks over so that some in the middle were not properly annealed. A modified spiral design cured this problem.)

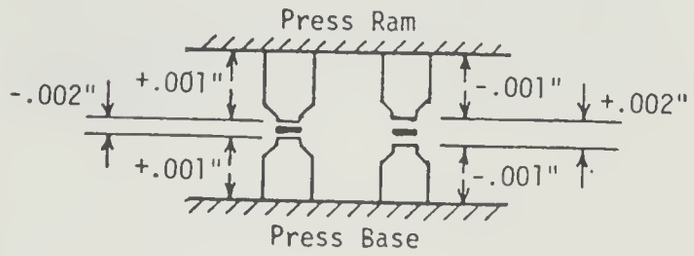
(Mint comment) Light strikes can also be produced during normal striking operations due to mechanical tolerances of the dies and blanks. This is particularily applicable to the quad die presses. The dies are manufactured to a length tolerance of plus or minus one-thousandth of an inch and of course there is a thickness tolerance for the blanks. If several of the obverse and reverse dies are paired together that have tolerances on the long side (i.e., longer by one-thousandth inch each) and one pair have length tolerances on the short side (i.e., shorter by one-thosandth inch each) then the effective combined length of one pair of dies can approach being four thousands shorter than several other pairs. This combined with a blank on the thin side of a thickness tolerance can result in insufficient striking pressure for that one pair of dies and thus weak or light coin strikes. (My observation) Another factor is the slight tilting of the die fixtures causing differences in spacing between

upper and lower dies in quad set-up. Of course, the die setter checks for these things during the initial press adjustment but this example illustrates how mechanical tolerances are a factor in producing light strikes.

Since I've run out of space this week, I'll continue discussing variety/error causes next week.



GREASE IN PRESS
AND CLOTH SHIELDS



EXAMPLE BUILD-UP OF
DIE TOLERANCES

COINING VARIETIES AND ERRORS

by Leroy C. Van Allen C1424

(Fifteenth in a Series)

This week we'll examine the causes of some of the more spectacular varieties/errors of coins during striking.

Partial Collar - (Mint comment) This is caused when the feed fingers mechanism fell short or overrode on the side of the blank. The blank is not deposited exactly centered in the collar and ends up tilted or not completely in the collar when struck. As a result, only part of the collar shows on the coin edge.

Broadstruck - (Mint comment) Broadstruck coins result when a blank is struck out of the collar (but centered so all of the design shows). It is caused when the lower die stays in the raised position for some reason after pushing the previous coin out of the collar and does not retract down. The next blank therefore lays on top of the raised lower die and doesn't deposit in the collar. (My observation) It can also be caused by a Type I blank without raised edges being too large to fit into the collar.

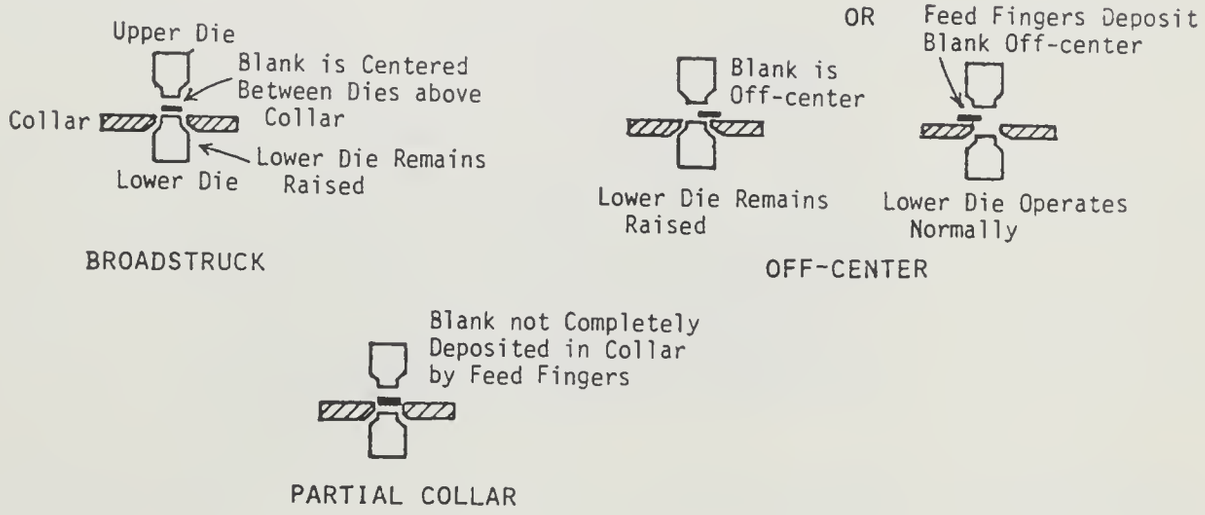
Off-Center - (Mint comment) These can be caused by either the lower die remaining in the raised position or failure of the feed fingers to deposit the blank centered over the collar.

Die Clashes - (Mint comment) In the newer Bliss presses there is an electrical switch that can stop the mechanism in an emergency in about 30^{o} rotation of the drive wheel. (However, the switch has to be activated by the press operator.) If the feed fingers let go of a blank too fast, it will completely miss the collar. The result will be a die clash (obverse die hitting reverse die and transferring some of the design which shows up on subsequent coins) because a blank is not between the dies. There are adjustements in the press mechanisms to set the feed finger opening and closing timing and the exact throw of the feed fingers.

(Mint comment) Multiple blank feed fingers sometimes lose a blank because one is slightly smaller in diameter and is not tightly gripped. This can also result in a blank not being deposited in the collar and the dies clashing. If only one blank is missing in a dual or quad press set-up, then a die clash will result. This is because the dies are set initially to interfere in order to achieve sufficient striking pressures. The ram, stake block, dies and press frame all act like springs during the high striking pressures requiring the die interference without a blank.

(Mint comment) Sometimes the die clash can be stoned out by hand by the die setter. If the die clash is too severe then the die is retired. This is a judgment factor by the die setter.

I see that my space is already up so we'll have to examine the causes of additional varieties/errors next week.



COINING VARIETIES AND ERRORS

by Leroy C. Van Allen C-1424

(Sixteenth in a Series)

We conclude our examination of the causes of some varieties/errors of coins during striking.

Die Cracks - (Mint comment) The coiner or press operator will notice die cracks developing from the periodic examination of coins from the coining press trap. On the reverse or obverse dies of certain coin denominations, certain cracks develop which the press operator knows from experience to look for. For example, the obverse quarter die usually develops cracks first in a horizontal line at the bottom of the neck line.

(Mint comment) A die with a crack is not allowed to be run on the presses very long. It could hurt someone as the crack opens up and the die then shatters. (My observation) The Bliss presses all have the feed finger and die area enclosed in a metal box with a clear plastic cover on top that is easily removable for access to this area. There is a safety switch that shuts the press off when this plastic cover is removed.

Orange Peel - (Mint comment) This surface roughness appears on the coin field and is due to die wear. Dies are normally retired because of excessive wear such as this orange peel effect or weakening of the design detail rather than due to die cracks.

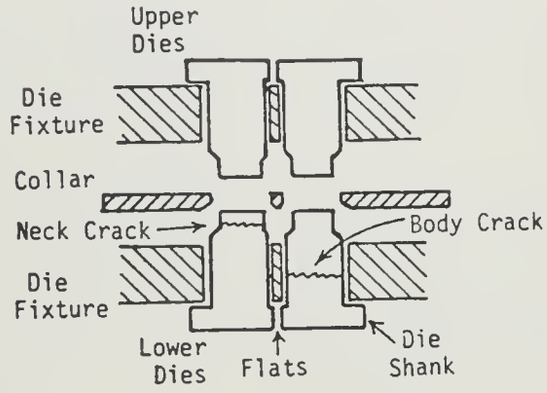
Rotated Die - (Mint comment) The only time a rotated die can occur nowadays is if the reverse die is cracked right through the neck, and it remains in the lower die fixture. It would thus be free to rotate and yet not fall out of the die fixture. Flats on dies allow only one position in the presses. When the die setter adjusts the dies, he also does a line-up check for rotated dies.

(My observation) The 1, 5 and 10 cent dies with shanks could also crack through the die body and be free to rotate. This could not happen on larger denomination dies that don't have shanks but have the flat on the die body. However, a lower die cracked completely through the neck or body would be an extremely rare occurrence.

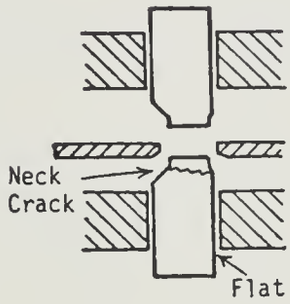
Ejection Doubling - (Mint comment) This occurs when the ram or top die comes down, strikes the coin and shifts. Two thousandths play is enough to cause shift in the coin material. Play in the press mechanisms causes the doubling. This is not ejection doubling but is called press shift doubling due to looseness of the press mechanisms during the coin striking. It also explains the doubling of a coin from the

lower die due to looseness in the lower die mechanism or uneven surface on the stake block just underneath the dies. The force exerted by the lower die in raising up and pushing the struck coin out of the collar is not enough to cause any doubling. Therefore, ejection doubling is an incorrect term and should not be used.

Next week we'll conclude this series with the final operations in the Coining Department, counting and bagging.



ROTATED DIE (1¢,5¢,and 10¢)



ROTATED DIE
(25¢, 50¢,and $1.00)

COUNTING AND BAGGING

by Leroy C. Van Allen C-1424

(Seventeenth and Last in a Series)

With the review of the final coining steps, counting and bagging, we will conclude our series on the coining operations at the Philadelphia Mint.

When the coins are dumped from the trap on the side of the cent coining presses, they pass through a vibrating screen and travel by a short conveyer belt to the main conveyer line in back of the presses. The coinage output of an automated cent line is produced by two rows of six presses each. Two main conveyer lines take this coinage output up to a tank where the coins are weighed in 400 lb. batches. After being weighed the coins drop into a holding tank which feeds two counting and bagging operations.

At the bottom of the coin holding tank are two outlets. They each drop coins into a short vibrating screen about 18 inches long and 10 inches wide. This screen consists of two pans one above the other. The top pan has holes that just pass coins of the proper diameter. The bottom pan is solid and drops the screened coins into the first counter eliminating most oversize coins such as broadstrikes and off-centers.

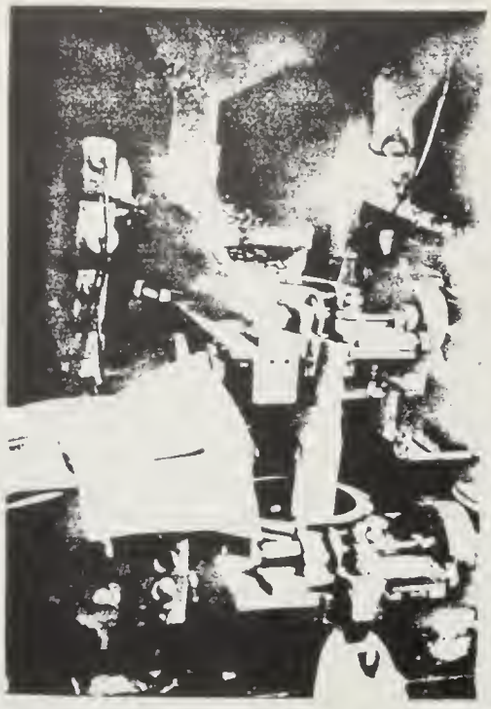
The coin count is made by a double count using two counters in sequence. The upper counter has a count set lock. When it reaches a certain pre-set count of 5,000 for the cents it automatically stops. The lower counter is a continuation count type and continues to count as long as coins pass through the revolving feed bowl. If the lower count agrees with the upper machine then the overall count is considered accurate.

As the coins are counted by the lower counter, they drop into a canvas bag. After the count is verified by the lower counter, an operator sews the canvas bag shut. An automatic hand stitching machines hangs on a reel above the lower counter. The operator pulls the stitcher down whenever the bags are ready to be sewn. Sewn bags are stacked on carts and stored in vaults until ready for shipment to Federal Reserve Banks via trucks.

Coins from the batch processing lines are processed through similar counters. Tanks full of coins are placed above the upper counter and feed down into the vibrating screen and on through the two counters. There are seven counting stands for batch processing with four counters per stand.

This concludes the series on coining operations at the Philadelphia Mint. Through the courtesy of the Bureau of the Mint, I've been able to share a first-hand tour. As we have seen, it is a complicated process of many steps with emphasis on high production!

Seventeenth in a Series



COUNTING AND BAGGING

LESSON 11: HOW TO BUY COINS
by William Gay

William Gay is currently Vice-President and Director of Purchasing of First Coinvestors, Inc. in Albertson, New York and has been with the Company for 8 years. He was a Numismatic Coin Advisor with the Company handling approximately 500 accounts, then became Director of Fulfillment in charge of Type, Gold and Silver Dollars.

Before coming to First Coinvestors, Inc., he was financial consultant with an aviation consulting firm and spent 7 years with a major international airline in several management positions.

He is a member of the American Numismatic Association, Florida United Numismatists, Central States Numismatic Association, Society of Paper Money Collectors and has appeared as a guest lecturer on Channel 21 speaking on the Institute of Numismatic and Philatelic Studies at Adelphi University.

LESSON 12: INTRODUCTION TO GRADING AND AUTHENTICATING
by Charles R. Hoskins

Charles Hoskins is the Director of the International Numismatic Society Authentication Bureau in Washington, D.C. The Bureau authenticates rare coins sent to them by collectors and dealers from all over the world. He is assisted by F. Michael Fazzari, head of the INS authentication laboratory. Mr. Fazzari conducts the advance course in rare coin grading and authenticating which is offered each semester at Adelphi University.

Mr. Hoskins was on the staff of the Money Museum of National Bank of Detroit, and was its Director from 1966 to 1970. He then joined the United States Mint in Philadelphia where he was Public Information Officer and Head of the Numismatic Services Division. He was in charge of ANACS when it was located in Washington, D.C. In 1976, Messrs. Hoskins and Fazzari founded the INS Authentication Bureau as a Division of the International Numismatic Society.

Mr. Hoskins is on the Board of Overseers of the Institute of Numismatic and Philatelic Studies and is a frequent lecturer at its numismatic courses.

NOTE: Photographic copies of the slides used in the course-in-residence have been made available by Mr. Hoskins on pages 65-72.

1. 1928 Peace dollar, cast counterfeit, lettering poor

2. Cast counterfeit, Morgan dollar, extra metal

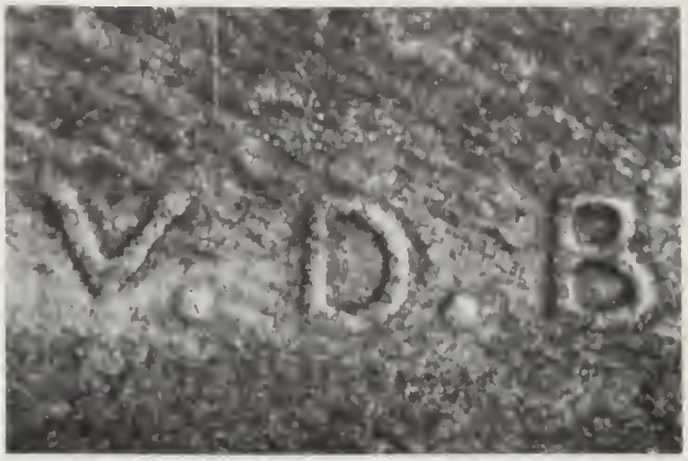
3. Genuine 1787 N.J. Colonial cent

4. Electrotype 1787 N.J. Colonial cent

5. Genuine V.D.B. cent

6. Altered "S" on 1909-S Lincoln cent

7. Genuine 1909-S V.D.B. cent

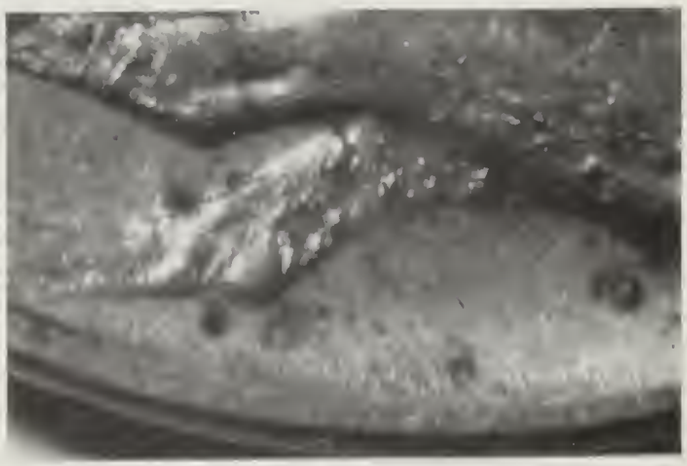


8. Counterfeit V.D.B. initials

9. Genuine 3-legged Buffalo nickel

10. Genuine 1937-D 3-legged Buffalo nickel

11. Genuine 1937-D 3-legged Buffalo nickel



12. Genuine 1937-D 3-legged Buffalo nickel

13. Genuine 1916-D dime

14. Counterfeit 1916-D Mercury dime

15. Counterfeit 1916-D dime, altered mint mark

16. Genuine 1942/1 dime

17. Counterfeit 1942/1 dime

18. Genuine 1932-S quarter

19. Altered mint mark on 1932-S quarter

20. Genuine 1932-D quarter

21. Die smear on a genuine 1932-D quarter

22. Added "D" mint mark on 1932-D quarter

23. Genuine 1921-D half dollar

24. Counterfeit 1921-D half dollar

25. Genuine 1855 type 2
$1 gold piece

26. Counterfeit 1855 type 2
$1 gold piece

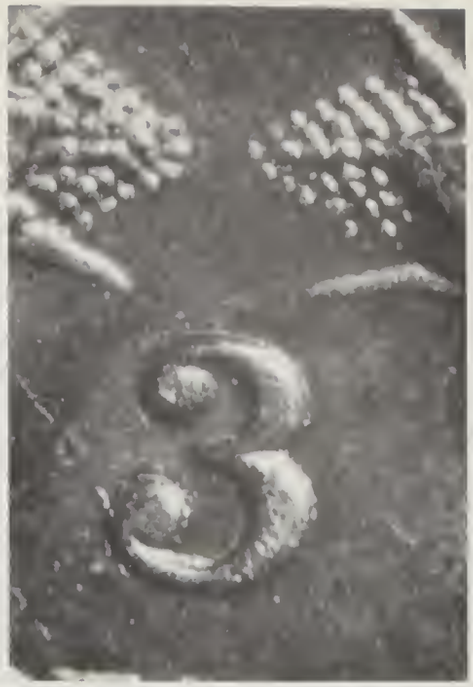
27. 1855 type 2 $1 gold piece

28. Counterfeit 1855 type 2
$1 gold piece

29. Genuine 1855 type 2
$1 gold piece

30. Counterfeit 1855 type 2
$1 gold piece

31. Genuine $3 gold piece



32. Counterfeit $3 gold piece

33. Whizzed "United" on $1 gold piece

34. Full mint lustre on a Peace dollar

35. Whizzed Peace dollar

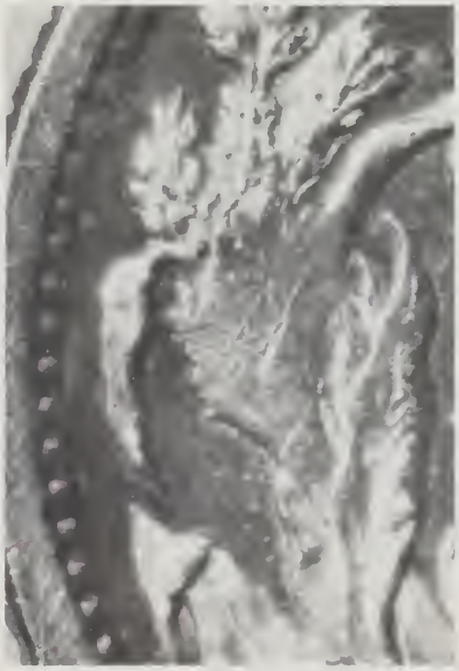
36. Whizzed Lincoln cent

37. Choice BU $3 gold piece

38. Lustre breaks caused by abrasions on $20 St. Gaudens

39. Lustre breaks on high point on $20 St. Gaudens

40. Flat strike on hair over Miss Liberty's ear on Morgan dollar

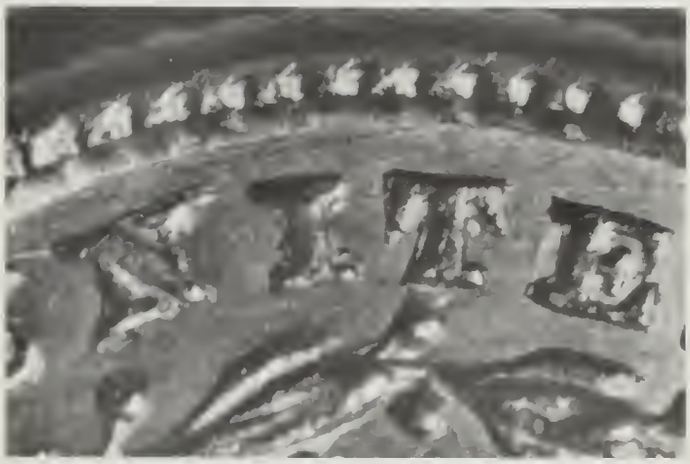


41. Flatly struck wreath

42. Flatly struck star on a genuine gold piece

43. Flat denticles on $2½ gold piece

44. 1861 clashed die $1 gold piece



45. Heavy radials & die scratches on denticles

46. Repaired edge on a $1 gold piece

47. Repaired edge

48. Jewelry damage on $2½ Indian gold piece

LESSON 13: NUMISMATICS AS A BUSINESS AND INVESTMENT MEDIUM
by Donald J. Hoppe

Donald J. Hoppe is president of INVESTMENT SERVICES, INC., an investment advisory and publishing firm located in Crystal Lake, Illinois. He is associated with several other investment organizations, including MONEY MANAGEMENT CORPORATION, a Chicago-based international investment advisory firm, and FIRST COINVESTORS, INC., one of the largest publicly-held rare coin and stamp firms in the country.

Mr. Hoppe is the author and publisher of the Donald J. Hoppe Business and Investment Analysis, an investment advisory letter published approximately every two weeks and distributed to clients throughout the U.S. and abroad. A contributor to numerous financial and investment publications, including The Investing Professional, Coin World, M/G Financial Weekly and the Common Stock Reporter, he is the author of two books, "How to Invest in Gold Coins" and "How to Invest in Gold Stocks and Avoid the Pitfalls."

Donald Hoppe has appeared on a number of radio and television programs and is a frequent lecturer at national and international conferences and seminars on investment and monetary problems. He has also been a guest on major radio and television programs, including NBC-TV, BBC World Service and the Stock Market Observer (WCIV-TV, Chicago.)

NOTE: Mr. Hoppe's reference to the "silver fiasco" occurred two weeks prior to his lecture in March 1980.

LESSON 14: NUMISMATIC PERSPECTIVES
by John J. Ford, Jr.

John J. Ford, Jr. is a world renowned numismatist and regarded by many as the "dealer's dealer." Founder of the Professional Numismatists Guild and chairman of its Committee on Ethics, he is also the organizer of Forums on false coins sponsored by the PNG.

He appears as a speaker at numerous national, regional and local numismatic conventions and meetings and is a frequent contributor to The Numismatist, Numismatic Scrapbook, Coin Collector's Journal, Coin World and other numismatic publications. He is the editor of Whitman's Standard Catalogue of U.S. Coins.

Mr. Ford is a fellow of the Royal Numismatic Society; a life member of the American Numismatic Association; a member of the American Bank Note Society and American Numismatic Society. He is a frequent lecturer at Adelphi University's Institute of Numismatic and Philatelic Studies in Garden City.

LESSON 15: HOW TO SELL COINS
by Herbert Melnick

Herbert Melnick, treasurer and executive director of Numismatic Antiquarian Service Corp. of America (NASCA), is considered one of the nation's leading numismatic auctioneers.

Mr. Melnick's interest in numismatics began while he was a student in high school and has continued ever since.

In addition to holding successful public auction sales for the Great Eastern Numismatic Association, the Suburban Washington, D.C. Coin Convention and the Early American Copper Society, Mr. Melnick handled some of the finest collections of coins to come on the market in recent years.

Mr. Melnick has become one of the foremost auctioneers in the country, performing as auctioneer in dozens of sales including the American Numismatic Association convention sales of 1976, 1977, 1979, and 1980. He was awarded the A.N.A. educational award for his knowledge of the auction business.

In addition to his NASCA duties, Mr. Melnick is currently serving on the board of directors of the Institute of Numismatic and Philatelic Studies. He has lectured at Adelphi University at their Center of Banking, Money and Management.

He holds membership in the American Numismatic Association, is an associate member of the American Numismatic Society and serves on the ethics committee of the Professional Numismatists Guild.

LESSON 16: PROPER CARE OF YOUR COIN COLLECTION
by Walter Breen

Respected worldwide for his knowledge of U.S. currency and coinage, Walter Breen has authored some 37 volumes on almost every aspect of numismatics and is the author of Walter Breen's Encyclopedia of U.S. and Colonial Proof Coins 1722-1977. He is co-author with Anthony Swiatek of the Encyclopedia of U.S. Gold and Silver Commemorative Coins 1892-1954, published by FCI/Arco Publishing Co., Inc., the first comprehensive work on commemorative coinage ever attempted.

Walter Breen entered Johns Hopkins University in September of 1950 and graduated ten months later with a Bachelor of Science Degree and some of the highest marks ever recorded at that University. He is familiar with fourteen different languages, is an expert in the fields of medieval music as well as chemistry, physics, and various social studies, but mostly he is known for his numismatic expertise. Mr. Breen dug out the facts and statistical evidence which form the basis of the major catalogs and works on U.S. rare coins over the past 22 years.

Mr. Breen, a contributor to the Numismatic Section of the Encyclopedia Britannica and consultant to the Smithsonian Institution, is the recipient of the American Numismatic Association Heath Award; the Fifth Award in Poet Laureateship of California; the Silver Medallion of Honor from Roosevelt University; was made Honorary Vice-President of the Rittenhouse Society; and serves on the Board of Overseers at Adelphi University's Institute of Numismatic and Philatelic Studies.

A

ACTIVATED Said of metal surfaces when through any kind of physical or chemical action the top layer is rendered more susceptible to oxidation reactions (tarnish, etc.). Many cleaning agents activate coin surfaces.

ADJUSTMENT MARKS File marks, inflicted on a planchet before striking, to bring weight down to mint standard. They do not constitute impairment to a coin.

ALIGNMENT The angle at which coin or medal dies are oriented. In the USA, alignment for coin dies is normally 180° or head-to-toe; if the coin is held at top and bottom and rotated, the upright obverse will face an inverted reverse.

ALLOY The resulting solid solution of metals melted and mixed in specific proportions by weight is called an alloy. Coinage metals are generally alloys whose proportions have been specified by law.

ALTERATION Fraudulent change of one or more numerals of date, or addition, removal or change of a mintmark, etc. to make a commoner coin simulate a rarer issue.

ANNEALING Heating (of a die blank or partly completed working die) to redness, then cooling very gradually to eliminate stress-hardening and render the metal soft enough to be worked (hubbed, punched, engraved, etc.)

ASSAY Test to ascertain proportion of precious metal. An assay office was intended to certify - as by officially stamping on ingot produced from ore samples - their gold and/or silver content.

ASSEMBLED SET A proof set completed over the months or years by buying individual coins.

ATTRIBUTION Identification of die variety of a coin in the standard reference works for its denomination or type.

B

BILLION Any low grade alloy of silver and copper, generally with copper predominant.

BLANK Flat disc onto which a design is stamped to make a coin, same as a planchet.

BLANK-CUTTER Machine built on the same principle as a cookie-cutter; rolled strip of proper thickness for the finished coins is passed within it, and the first-process blanks are cut out, after which they are weighed, annealed, cleaned, upset (rendered thicker at edge than at centers), and finally sent to the coining presses.

BORDER Raised outer boundary or periphery of a coin, generally ornamented by BEADING or DENTILS prior to 1916, more recently consisting of a plain raised lip. Its purpose is protection of devices from excess wear, and enabling the coins to stack.

BOURSE Hall at a convention, where dealers set up commercial displays for selling their wares to each other and/or to collectors.

BRANCH MINT One of the mints at cities other than Philadelphia, legally regarded as subsidiary to the latter.

BRONZED Given a protective coating by baking bronzing powder onto a coin or medal. This process appears to have been invented in the Boulton & Watt mint in the late 1780's or 1790's, experimentally used in the Philadelphia Mint in the early 1830's, then commonly used on medals in the 1860's. The composition of bronzing powder is unknown.

BUCKLING Die failure manifesting as compression and caving-in on the die, as a bulge on the finished coin.

BULLION Precious metal as received for processing by a mint.

BUSINESS STRIKE A coin struck normally (only one blow from the dies) and intended for normal circulation or commercial use.

C

CAMEO Devices in relief or embossed, like our current coin. Ant.: intaglio.

"CARTWHEEL EFFECT" Mint bloom consisting of radial corrugations which vanish rapidly with even brief circulation.

CAST Molded from molten metal; formerly a common way of making counterfeits.

CAST BLANKS Planchets made by casting rather than by cutting from rolled strip. Many private tokens were so made, though the process was long illegal in European mints and was always illegal here.

"CHERRYPICK" To pick out a rarity among coins offered as ordinary ones of their type.

CIRCULATED Passed from hand to hand; showing signs of wear from this process. Ant.: Uncirculated.

CLASH MARK When a pair of working dies come together with the same force they normally apply to the blanks, leaving their impression on each other; these impressions are called clash marks. Normal mint practice has been to remove them from the dies.

CLOSE COLLAR A heavy block of metal containing a hole the exact size of a finished coin, placed in a press to fit over the lower die, so that the blank is confined at the moment to striking. The close collar standardizes diameters of coins, and imparts the reeded edge to silver or gold coins.

CLOSED The date LOGOTYPES furnished for the earliest coins of 1873 featured a numeral 3 whose large knobs came very close together, in the smaller denominations nearly touching. This was found unsatisfactory and was immediately replaced by the OPEN 3 logotype.

COLLAR Metal part fitting between working dies, containing a cylindrical opening into which the blank ready for stamping was to fit; intended to position it on the lower die and to discourage indefinite expansion on striking.

COLLAR DIE Same as close collar.

COLONIALS Loosely, any and all coins made for circulation in or by the various colonies before the adoption of the Constitution.

COMMEMORATIVES NCLT(non-circulating legal tender) coins made by normal coinage authority and processes, but bearing authorized devices memorializing some historical event or site.

CONTRACT COINAGE Coinage manufactured by private firms operating under a franchise granted by a government, such as the state coinages of New Jersey, Connecticut and Vermont, the FUGIO cents, and the Boulton & Watt "cartwheel" issues.

COPPERS Copper coins of somewhere near halfpenny size, without stated denomination. During the 1780's in the USA they passed at 14 or 15 to the shilling, whereas a Tower Mint halfpenny, officially 1/24 of a shilling, would have been accepted at probably the higher figure had it been available. Coppers fell to 1/60 the shilling, thereafter ceasing to be acceptable after 1790.

COUNTERFEIT Anything falsely made by private parties, in imitation of legal coinage, and intended to pass as the latter.

COUNTERSTAMP Letters, numerals, ideographs or devices stamped onto a coin after manufacture.

CURRENCY (1) legal authorization to circulate. (2) Passing in trade as money. (3) Bank notes or Treasury notes of any kind, passing as money or as a substitute for money.

D

DEBASEMENT Issue of coins of too low fineness or too light weight.

DECIMAL SERIES Set of denominations such that the 1/10 and 1/100 parts of an official unit are both represented in coinage, with or without their multiples or fractions. Example: dollar, dime, cent, in USA or Canada.

DENTICLE, DENTIL Small tooth-like or radial-line unit of border ornamentation.

DENOMINATION Numerical name for a coin expressing its value as a multiple or fraction of a unit, as three-cents, quarter dollar, half eagle. Most coins were regularly believed to have a denomination but their common names did not reflect the original numerical value; e.g., copper, fish scale (a 3¢ silver), nickel, shilling, crown, guinea.

DESIGN Principal combination of devices or representations on a coin, specified by law.

DEVICE Principal design element, e.g. portrait, seated figure, wreath, eagle.

DIE Steel cylinder impressed with a design and intended for stamping blanks with that design to make them into coins.

DIE VARIETY Variety differing in at least one working die from others of its design, date, and type. When dies were made by complete hubbing except for date, varieties could be distinguished principally by variations in the position of the date; since 1916, only by minute details of finishing. Before 1795 dies were cut by hand, even a device puncheon (q.v.) being the exception, and accordingly working dies had much individuality.

DOLLAR Monetary unit intended as equal to the Spanish 8-reales, later defined in American coinage law as the equivalent of 416

grains of silver of 1485/1664 fineness, later as 412½ grains silver of 9/10 fineness. At present the term is equivalent to the arbitrary unit of paper fiat money, without reference to any weight of silver or gold.

DOUBLE EAGLE Gold coin of the value of 20 dollars, 1849-1933.

E

EAGLE Gold monetary unit and coin of the value of 10 dollars, 1795-1933.

EDGE Cylindrical (curved) surface boundary; it may be plain, as on cents and nickels, or reeded, as on higher denominations, or lettered, as on 1907-33 double eagles, or ornamented, as on 1907-33 eagles.

ELECTROTYPE A copy made by fabricating thin shells by electro-deposition, and affixing both obv. and rev. shells to a lead core.

EXPERIMENTAL COIN Test of a new circulating medium - a new metal or alloy, new denomination, new manufacturing method, etc., but not a mere new design.

F

FACE VALUE In recent decades, same as denomination; formerly, when coins were valued by weight, the face value was equated to bullion value if the coin was full weight, and presumed to be close to that until weight and fineness were ascertained, the latter by use of a touchstone. Gold coins were always valued by weight, not by tale, e.e. not by face value.

FANTASY PIECE Simulated series coin (q.v.) or similar item. The 1866 no motto coins and 1859-60 5¢ and 10¢ without mention of UNITED STATES are fantasy pieces.

FIELD Blank background in which devices are placed.

FIRST STRIKE Early impression from working dies retaining initial polish, but not given the standard proofing process.

FROST Peculiar surface found on pristine Mint State coins before they circulated, with a lustre vaguely reminiscent of newly formed frost on a windowpane.

G

GALVANO Metallic model obtained by the electrotyping process,

made from a sculptor's bas-relief, and used in early stages of translating a coin design into metal from which dies would eventually be made.

GLORY In heraldry, referring to a scattering of stars above a device.

GREENBACK Paper currency of the United States, not redeemable in gold or silver; this term was used indiscriminately for demand notes of 1861 and for LEGALS of later years.

GERMAN SILVER Any of various alloys of copper, nickel, zinc + trace elements.

H

HAIRLINE(D), HAIRMARK(ED) (Bearing) minute to microscopic scratch(es) on a proof surface, the result either of cleaning with baking soda paste or other abrasive, or of wiping with any cloth less soft than the coin's surface. Ant.: pristine.

HALF DIME U.S. silver coin, 1794-1873,=1/20 dollar, 1/5 quarter or 5 cents.

HALF DOLLAR U.S. silver coin, 1794-1964 (more recently sandwich metal) = 50 cents.

HALF EAGLE U.S. gold coin, 1795-1929, of value 5 dollars.

HALF PENNY (collective pl. halfpence) British copper or bronze coin, offically 1/24 shilling, 1/480 pound sterling. The term was also used to mean coppers (q.v.), though they passed at rates more like 1/15 or 1/14 shilling until the 1790 "Copper Panic" which collapsed them to 1/60 shilling or worse.

HAMMER METHOD Ancient manner of stamping coins. The moneyer fixed the lower die in an anvil or tree stump, rested the blank on it, placed the upper die atop the blank, holding it in place by hand or tongs, and signaled his assistant to use a sledge hammer. The method was faster than the first screw presses, and very dangerous for moneyers' fingers.

HOPPER Receptacle into which blanks are poured, and from the bottom of which blanks are mechanically fed into the collar-and-die assembly in a coining press.

HUB (n) A type of die used not for striking coins but for imparting designs to working dies. Later hubs included lettering; still later ones included dates. (v) To impart a design by a

hub onto one or several working dies. In this sense, the design is said to be "entered" or "transferred"-ordinarily two or more entries are necessary, the die blank having to be annealed between them to remove stress-hardening.

I

INCUSE(D) Sunk below neighboring surfaces, intaglio (q.v.) Ant.: embossed, in relief, cameo.

INDIAN HEAD CENT A misnomer. Common name for the Longacre design of cent, 1859-1909, showing Ms. Liberty (after a Greco-Roman statue known as the Venus Accroupie, in one of the local museums) adorned with a feathered headdress. No Native American ever bore that profile!

INSCRIPTION Words on a coin, in any position. Generally, the term legend is reserved for inscriptions around the periphery.

INTAGLIO Sunk below neighboring surfaces - said of a design, whereas 'incuse' more often refers to lettering. Working dies are intaglio so that the coins will show devices and letters in cameo. Ant.: cameo, in relief.

K

KNIFE-EDGE, KNIFE-RIM Raised line at outermost rim of a coin, from where metal was forced between die and close collar; called a 'fin' in the mint, and commonly a 'wire edge' by coin collectors. Not diagnostic of proofs.

L

LAMINATION DEFECT A defect in a PLANCHET or BLANK, incurred before striking, resulting from splitting or peeling away of layers.

LAPPING Grinding or polishing down of a DIE on a lapstone, either to impart a mirrorlike surface or to remove defects, such as CLASH MARKS.

LARGE CENT Copper cent, originally weighing 208 grains, later 168, coined 1793-1857. Not called large cent until about 1860; earlier known only as copper cent.

LEGAL TENDER Coins with this status may be offered in payment of any debts or taxes and must be accepted in such offers of payment. The U.S. Constitution limits this quality to gold and silver, for which reason the legal tender status of bronze cents

LEGAL TENDER cont'd
(Act of April 22, 1864) and of nickel coins (Acts of 1865, 66, etc.) has been the subject of many disputes over constitutionality.

LEGEND Inscription around the periphery of a coin or medal.

LINT MARK Small shallow incuse mark on a coin, inflicted at the moment of striking, when a fibre of any kind (generally from a cloth used for wiping dies) is compressed between die and blank. Not an impairment.

LOGOTYPE Punch containing more than one digit of a date, or a name rather than a single letter. Date logotypes began being used in the Philadelphia mint about 1840, either 2-, 3- or 4-digit units according to size.

M

MACHINE-MADE COIN One struck on a screw press rather than by the hammer method.

MASTER DIES Dies used for raising hubs, which in turn would sink working dies.

MATTE PROOF A proof given a uniformly granular or dull surface, often by pickling in acid. The technique dates back to about 1896.

MEDALLIC PROCESS Giving a blank multiple impressions from working dies, to bring up high relief details. Routine for medals, necessary for proof coins, but absolutely undesirable for production coins (business strikes).

MEDALLIST One who makes medals, specifically the designer and/or diecutter.

MINT 1) (n.) Factory where coins are made. 2) (v.) To manufacture coins; to stamp designs on blanks. 3) (adj.) Perfect condition - syn., uncirculated more often, mint state.

MINTAGE 1) Quantity of coins struck of a given type or date. 2) Process of striking coins.

MINT MARK Letter identifying the mint from which a coin was issued. Philadelphia-P (on WARTIME SILVER 5¢ only); Denver-D; San Francisco-S; New Orleans-O; Carson City-CC. On gold coins 1836-61 only, C=Charlotte, D=Dahlonega.

MINT STATE Perfect pristine condition, said of a PRODUCTION COIN.

MORGAN DOLLARS Silver dollars (1878-1921) designed by George Morgan, issued pursuant to the Blank Act, a subsidy for silver mine owners.

MULTIPLE STRIKING Visible evidence of the medallic process, q.v., or sometimes evidence of accident whereby an already-struck coin received additional impressions from the dies.

N

NICKEL-CLAD Same as "sandwich metal", thin layers of cupro-nickel (75% copper, 25% nickel) bonded to a core of copper; used on 10¢, 25¢ since 1965, later also on 50¢ and Eisenhower dollars.

O

OBVERSE The "heads" side of a coin, bearing (in U.S. usage) the effigy of Ms. Liberty or the portrait. On the Flying Eagle cents, the eagle side is the Obverse, on the 2¢, it is the shield side; on the silver 3¢, it is the side with the star.

OPEN COLLAR Metal plate, fitting loosely above the lower die, and with a hole somewhat wider than the finished coin; too wide to restrain a blank in striking. Its purpose is to position the blank on the lower die, without squashing previously applied edge lettering or reeding.

OPEN 3 The date LOGOTYPES furnished Feb.-March 1873, to replace the unsatisfactory CLOSED 3 group, feature a numeral 3 with a small knobs spaced far apart.

ORIGINAL Denoting a coin made in the year of its date; in contrast with RESTRIKE.

ORIGINAL DIES 1) master dies, q.v.; 2) dies made for an original issue. In the former sense, ant.: working dies, in the latter sense, ant.: copy dies.

ORIGINAL SET Proof set as received from the mint, containing the identical specimens put together at the mint to make up the set.

OVERDATE A date in which one digit has been repunched, at the mint, over a different digit, either for reasons of economy or in an attempt to rectify a blunder.

P

PARENT MINT The Philadelphia Mint, to which all the other branches were considered as subordinate, and to which they made their regular reports.

PATTERN Proposed coin design not then adopted.

PEDIGREE Sequence of owners of a coin.

PENNY 1/12 shilling = 1/240 pound sterling. Not to be confused with cent.

PLAIN EDGE Edge without lettering, reeding, or other ornamentation, as our current cents and nickels.

PLANCHET Same as blank; disc on which a design is to be stamped to make a coin.

PLANCHET DEFECTS Defects on a BLANK before striking, including both LAMINATION DEFECTS and cracks.

PRODUCTION COINS Coins made for circulation, as distinguished from PATTERNS and PROOFS.

PRESENTATION PIECES Coins minted with unusual care, from new dies on carefully selected blanks, intended for presentation to visiting dignitaries or other VIPs, before the process of making proofs was standardized in 1817.

PRESS Engine for stamping dies onto blanks, or for hubbing dies.

PRISTINE New, never cleaned or handled. Ant.: hairlined, cleaned, etc.

PROOF Col. J.R. Snowden's term for coins specially made for collectors, given additional blows from the press to bring out the design in greater detail than PRODUCTION COINS. The old style Proofs (prior to 1908 on gold, 1916 on silver, 1913 on nickel, 1909 on bronze) had mirrorlike fields, frosty devices. Later Proofs prior to 1936, called MATTE PROOFS, showed a variety of satiny or granular finishes. Since 1936 attempts have been made to produce Proofs as near as possible to the old style, but most of them are mirrorlike on the relief devices as well.

PROOF-ONLY ISSUE A date or type issued with the proof sets or only in proof state, not for circulation; examples-1873 2¢ and silver 3¢, 1877 nickel 3¢ and 5¢, 1858 silver dollar, 1841 and 1863 quarter eagle, etc.

PROOFLIKE Dies for production coins are often polished, so that the earliest impressions from them resemble Proofs, though they do not as a rule have the extra sharpness. Such coins are commonly termed proof-like coins or first strikes.

PROOF SET Set of proof coins of one date as issued from the mint.

PUNCH 1) (n.) Tool bearing a letter or numeral or ornament in relief, for sinking into a die blank. 2) (v.) To impart a letter, numeral, design element, etc., using such tools.

PUNCHEON Relief model bearing a major design element such as portrait or wreath or eagle, intended for sinking into a working die blank.

Q

QUARTER DOLLAR The 25¢ piece issued since 1796.

QUARTER EAGLE The $2.50 gold piece issued 1796-1929.

R

RARE Properly, denoting a coin of which only a limited number exist in collectors' hands. Other uses of the term, as on many modern issues which were hoarded by roll and bag speculators, are misnomers.

RARITY 5,6,7, etc. (See SHELDON SCALE).

RECUT Strengthened by hand engraving or repunching. Extra outlines generally show as evidence of recutting.

REDUCTION Either freehand or mechanical copying of a larger design into smaller dimensions.

REEDED EDGE The types of edge found on current dimes, quarters and halves; produced by a grooved close collar since 1828, earlier by Castaing machine. The ribs or grooves on the edge are collectively called reeding.

REEDING Raised ribs or fluting on the edges of silver or gold coins, similar to that found on the edges of current clad coins.

RELIEF Details of a design which stand up above the field, in cameo. The higher the relief, the more force - or the more blows from the dies - necessary to impart them to the finished coin or medal.

RESTRIKE A coin struck with a date earlier than the actual year of its manufacture.

REVERSE In U.S. usage, the side not showing the effigy of Ms. Liberty or the portrait. The wreath side is the reverse on all small cents prior to 1909, and on all 2¢ and 3¢ nickel coins; on the silver 3¢ the reverse is the side with the C and III.

RIM The thin line where BORDER and EDGE meet, on both sides of a coin.

ROLLED BLANK Planchet cut from rolled strip, q.v. Ant.: cast blank.

S

SATIN FINISH PROOF Type of matte proof in which the surfaces have a satiny texture altogether unlike sandblast; details of manufacture unknown. Most familiar - which is not saying much - on Roman Numerals proofs, a few commemoratives, and a couple of the 1921 proof Peace Dollars.

SCARCE Very uncommon, difficult to locate, but not rare in the strict sense of the term.

SCREW PRESS Essentially a rotating pile-driver, but used for stamping coins. The lower die is fixed in an anvil, generally by set-screw; blanks are positioned atop it by collar. The upper die is mounted at the end of a column fitted with screw threads, caused to descend rapidly with great force by rotating two weighted arms affixed to the top of the column, the arms attached to ropes pulled by teams of men or horses. Only the smallest presses could be operated by two laborers plus the moneyer. The above description holds regardless of whether automatic feed and/or automatic ejection devices had been installed. Syn.: Coyning Engine. Supplanted in more modern mints by the knuckle-action press, which replaces the rotating column by action analogous to that in punch-presses and the types of machinery used for shaping metal parts such as segments of automobile bodies.

SHELDON SCALE Dr. William H. Sheldon, in Early American Cents and Penny Whimsy, standardized a quantitative rarity scale, which we reproduce here by permission:

Rarity	Est. Population	Rarity	Est. Population
R-1	above 1250	R-5	31-75
R-2	501-1250	R-6	13-30
R-3	201-500	R-7	412
R-4	76-200	R-8	1, 2 or 3

SILVER-CLAD Outer layers of 80% silver bonded to a 21% silver core.

SLIDER Industry jargon for an Almost Uncirculated coin which can be sold in the marketplace for a higher grade.

SPECIAL MINT SETS Substitutes for proofs; allegedly selected production coins.

SPECIE Gold or silver coins.

SPECIMENS Pre-1850 Philadelphia Mint term for Proofs.

STELLA Gold coin of $4 denomination (1879-80, proposed, not accepted).

STRIA (E) Line(s), usually straight, in relief on a coin, often in parallel groups or randomly scattered; the parallel ones are something from the buffing wheel used to polish dies.

STRIKE 1) (n) Impression of relief detail. A "first strike" is from new dies retaining polish and often simulates proofs. 2) (v) To stamp the coin design onto a blank.

STRIKING 1) Impression or stamping of coins. 2) Impression of relief detail, as in phrase striking quality. 3) Batch of coins struck.

T

THALER Common name for various European dollar-sized silver coins.

THREE-CENT NICKEL Denomination coined 1865-89 to retire 3¢ fractional notes.

THREE-DOLLAR PIECE Gold denomination coined 1854-1889 to accommodate buyers of sheets of stamps.

TRADE DOLLAR Silver coin heavier than standard dollar (420 grains) intended for use in Chinese ports, coined 1873-85.

TRANSITIONAL COIN One struck of a design adopted the following year, or combining either die of the subsequent type with a die of the current type. Examples: 1865 silver coins with motto IN GOD WE TRUST, 1882 Liberty head nickels; 1858 Indian head cents with either the adopted rev. of 1857 (corn/cotton wreath) or the rev. to be adopted in 1859 (laurel wreath).

TRUNCATION Lower edge of neck or bust of a portrait or personification on a coin.

TWO-CENT PIECE Bronze coin struck 1864-73.

TYPE Major subdivision of a design; as 1883 nickels without and with CENTS, 1853 and 1873 coins without or with arrows at date.

U

UNCIRCULATED 1) Mint state, unworn. Ant.: circulated. 2) business strike, production coin. Ant.: proof.

UNEVEN STRIKING The vast majority of PRODUCTION COINS until very recent years had their designs only incompletely imparted by a single blow. Perfect striking to show full details of hair, feathers, leaves, etc.; was characteristic only of PROOF coins which received 2 to 4 blows each. Generally, ordinary coins showed more or less weakness on some areas of relief detail. Liberty Standing quarters normally come weak on heads, on shields and at knees and toes. Liberty Walking half dollars normally come weak on heads, branch hands and feathers on eagle's leg. There are similar characteristically weak areas on other denominations and designs.

V

VARIETY Variation in a design or type, introduced by human or mechanical vagary or sometimes by intentional modification - as in use of larger or smaller dates on 1828 dimes.

W

WHIZZING The artificial treatment of a coin by wire brushing, acid dipping, or otherwise removing metal from the coin's surface to give it the artificial appearance of being in a higher grade in order to command a higher price.

WORKING DIE A die actually intended for stamping blanks to make coins.

WORKING HUB A hub used for sinking working dies (q.v.)

NUMISMATICS I

HOME STUDY COURSE

FINAL EXAMINATION

NAME:_____

PART I - True or False

Please indicate T (true) or F (false) next to each question.

____ 1. The Nova Constellatio silver pieces represent the first patterns for coinage of the United States.

____ 2. The first regular U.S. mint issue coins were struck in 1793.

____ 3. Generally, the coins made at the Philadelphia mint carry no mint mark.

____ 4. The Nova Constellatio patterns were struck as part of a plan for a decimal coinage system created by Gouverneur Morris.

____ 5. Proof is a grade indicating the highest condition of coins.

____ 6. The 1st U.S. Commemorative coins were struck in 1892 for the Columbian Exposition.

____ 7. Coins made at the New Orleans mint bear the mint mark "NO".

____ 8. Our 1980 coins contain 10% silver with a copper-nickel core.

____ 9. Of all the coins presently made, the Washington Quarter series has been in existence the longest.

____10. In 1873, arrows were placed at the dates of some U.S. coins to indicate a change in the weight of the coin.

____11. Mint marks were punched in on the die by machine.

____12. Mint State 60 refers to the lowest grade of an uncirculated coin.

____13. Morgan and Peace dollars are 90% silver coins.

____14. U.S. citizens were prohibited from owning gold for monetary purposes in 1934.

____15. Krugerrands are rare gold coins with a substantial numismatic value.

____16. The only mint still in operation today is in Philadelphia.

____17. A proof coin is struck twice with highly polished dies.

____18. The United States at one time produced a half cent coin.

____19. Low grade common date coins are good auction material.

____20. There was a serious decline in the prices of BU Rolls in the early 60's due to overspeculation.

____21. Grade and scarcity are two of the most important factors in the value of coins.

____22. All of the dies for our coins are made in Philadelphia.

____23. Gold and silver bullion prices and rare coin prices always move in the same direction.

____24. Toning on uncirculated coins is always undesirable and should be removed by a chemical dip.

____25. On the 1878 Morgan Dollar, eagles with 8 tail feathers as well as eagles with 7 tail feathers were produced.

PART II - Multiple Choice

Please mark correct letter next to each question.

____ 1. Which of the following is not a denomination of the Nova Constellatio patterns?
(a) bit (b) dollar (c) quint (d) mark

____ 2. Which famous coin collection previously owned by Johns Hopkins University was sold in a four-part auction?
(a) John Ford Collection (b) Garrett Collection
(c) Brasher Collection (d) Mellon Collection

____ 3. The first U.S. Mint was located in (a) Philadelphia (b) Denver (c) New Orleans (d) Washington, D.C.

____ 4. The blank which becomes the actual coin is called a (a) slug (b) clad strip (c) planchet (d) galvano

____ 5. The tiny nicks and scratches on uncirculated coins are called (a) friction marks (b) mint errors (c) die varieties (d) bag marks

____ 6. Collecting by die variety is most popular with which of the following coins?
(a) Morgan & Peace Dollars (b) Buffalo nickels
(c) Seated Liberty dimes (d) Roosevelt dimes

____ 7. Which city never had a United States mint?
(a) Denver (b) Carson City (c) Washington, D.C.
(d) New Orleans

____ 8. A double eagle refers to what denomination of coins?
(a) $10 (b) $2 (c) 20¢ (d) $20

____ 9. The grade BU stands for (a) Barely Uncirculated (b) Badly Underpriced (c) Brilliant Uncirculated (d) none of the above

____10. The Brasher Doubloon was (a) an old Spanish Coin (b) made by a New York goldsmith in 1787 (c) a counterfeit Confederate gold coin (d) early double eagle made in Philadelphia

____11. A clipped planchet is a (a) mint error (b) die variety (c) early dime (d) worthless coin

____12. Which was never a denomination of U.S. gold coins?
(a) $1 (b) $2 (c) 50¢ (d) $20

____13. Most U.S. Commemorative coins were of which denomination?
(a) 25¢ (b) $1 (c) 50¢ (d) $20

____14. Which of the following are hazards of rare coin investment?
(a) overgraded coins (b) buffed or whizzed coins
(c) counterfeit coins (d) all of the above

____15. The highest grade on the Sheldon numerical grading system is (a) mint state 60 (b) mint state 65
(c) mint state 70 (d) mint state 100

INSTITUTE OF NUMISMATIC AND PHILATELIC STUDIES

ADELPHI UNIVERSITY

The following information will be helpful to us in making this educational experience more meaningful. Please include this completed blank with your final examination and mail it in the self-addressed envelope.

NAME_____ AGE Under 21 / 22-30 / 31-40 / 41-50 / Over 50

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COLLEGE			
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PRESENT OCCUPATION_____

COMMENTS:_____

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HOME STUDY COURSE EVALUATION

DATE_____

The Institute of Numismatic and Philatelic Studies would appreciate your cooperation in filling out the following questionnaire. We do not know, unless you tell us, how well our course is satisfying your needs and expectations. You may return the form to this office in the envelope provided. The form need not be signed. Please use the remaining space on the other side of the page if the space provided is not adequate for a particular question.

Study Guide

(a) Did the study guide contain information that helped you understand the course material?

(b) Was the study guide well organized?

Textbook

(a) Was the textbook appropriate for the course? If not, why?

Written Material

(a) Was the written material adequate and appropriate?

(b) Was it helpful in understanding the subject?

Cassette Recordings

1. The recording quality of the tapes was:
   generally good_____

   adequate_____

   poor_____

   other comments_____

   _____

   _____

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2. The material discussed on the tapes was

confusing and difficult to understand_____

straightforward and easy to understand_____

other comments_____

_____

_____

3. If I took another home study course:

I would like the course to include audio tapes_____

I think that the tape material would be more effective if it were put in print instead of being verbally expressed on tape_____

I have no opinion concerning the use of tapes with the course_____

Other comments and suggestions:_____

_____

_____

_____

_____

Examination:

(a) Were the questions on the final examination clear?

(b) Did they follow logically from the assignments in the course?

General Comments

(a) What did you like best about the course?

(b) What did you like least?

(c) Can you suggest improvements?

(d) Based on your experience with this course, would you recommend the home study course to a friend?

(e) Any additional comments?

CONGRATULATIONS!

You have completed this home study course in numismatics, demonstrating that you are a disciplined and motivated student. Whether you enrolled in this course for personal enjoyment or to enhance your career, or increase your knowledge in the field of numismatics, we hope you have enjoyed this learning experience.

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